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TRANSACTIONS

OF THE

AMERICAN PEDIATRIC SOCIETY

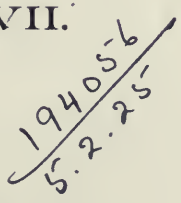
SEVENTH SESSION

HELD AT THE VIRGINIA HOT SPRINGS, MAY 27, 28 AND 29, 1895.

EDITED BY

FLOYD M. CRANDALL, M.D.

VOLUME VII.



REPRINTED FROM

THE ARCHIVES OF PEDIATRICS.

1895.

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LIST OF PRESIDENTS.

1889. A. Jacobi, M.D.
1890. J. Lewis Smith, M.D.
1891. T. M. Rotch, M.D.
1892. Wm. Osler, M.D.
1893. A. D. Blackader, M.D.
1894. John M. Keating, M.D.
1895. F. Forchheimer, M.D.
1896. Joseph O'Dwyer, M.D.

OFFICERS FOR THE YEAR—1895-1896.

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Second Vice-President.—Henry Koplik, M.D.....New York
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Recorder.—Floyd M. Crandall, M.D.....New York
Treasurer.—Charles W. Townsend, M.D.....Boston

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William P. Northrup, M.D.....New York
William D. Booker, M.D.....Baltimore
T. M. Rotch, M.D.....Boston
J. P. Crozer Griffith, M.D.....Philadelphia
B. K. Rachford, M.D.....Cincinnati
A. D. Blackader, M.D.....Montreal

MEMBERS—1895-96.

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Booker, William D., M.D.....851 Park Avenue, Baltimore
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CHRISTOPHER, W. S., M.D.....408 Centre Street, Chicago
CRANDALL, FLOYD M., M.D.....113 West Ninety-fifth Street, New York
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WENTWORTH, A. H., M.D.....10 Exeter Street, Boston
WILSON, J. C., M.D.....1437 Walnut Street, Philadelphia
WINTERS, J. E., M.D.....36 West Thirty-second Street, New York
YALE, LEROY M., M.D.....432 Madison Avenue, New York

MINUTES

OF THE

SEVENTH ANNUAL MEETING

OF THE

AMERICAN PEDIATRIC SOCIETY,

Held at the Virginia Hot Springs, May 27, 28 and 29, 1895.

First Day (*Morning Session*)—The meeting was called to order at 10 o'clock by the President, Dr. F. Forcheimer. The minutes of the last annual meeting were adopted as published in the ARCHIVES OF PEDIATRICS. At the request of the Secretary, a resolution was adopted making the following named persons the guests of the Society: Prof. James Stewart, Montreal; Dr. Welford, Toronto; Drs. W. C. Woodward, F. Leech, J. R. Wellington, F. S. Nash, and J. H. Bryan, Washington; Dr. A. A. Angell, Hot Springs; Dr. J. W. Wallace, Warm Springs.

The following members of the Society were present: G. N. Acker, M.D., Washington; S. S. Adams, M.D., Washington; A. Baines, M.D., Toronto; A. D. Blackader, M.D., Montreal; W. D. Booker, M.D., Baltimore; D. Brown, M.D., New York; E. M. Buckingham, M.D., Boston; A. Caillé, M.D., New York; W. L. Carr, M.D., New York; H. D. Chapin, M.D., New York; W. S. Christopher, M.D., Chicago; F. M. Crandall, M.D., New York; J. Dorning, M.D., New York; F. Forchheimer, M.D., Cincinnati; J. H. Fruitnight, M.D., New York; J. P. C. Griffith, M.D., Philadelphia; L. E. Holt, M.D., New York; F. Huber, M.D., New York; A. Jacobi, M.D., New York; C. G. Jennings, M.D., Detroit; H. Koplik, M.D., New York; W.F. Lockwood, M.D., Baltimore; A.A. Macdonald, M.D., Toronto; F. G. Morrill, M.D., Boston; W. Osler, M.D., Baltimore; F. A. Packard, M.D., Baltimore; B. K. Rachford, M.D., Cincinnati; T. M. Rotch, M.D., Boston; A. Seibert, M.D., New York; L. Starr, M.D., Philadelphia; W. P. Watson, M.D., Jersey City; J. C. Wilson, M.D., Philadelphia; J. E. Winters, M.D., New York,

The meeting was opened by the reading of the Annual Address by the President, Dr. F. Forchheimer, of Cincinnati.

Dr. T. M. Rotch, Boston, reported a case of "Cerebro-Spinal Meningitis in an Infant six days old."

Dr. W. F. Lockwood, Baltimore, read a paper on "Purulent Otitis Media, which Ended Fatally (3 cases)." Discussion by Dr. A. Caillé.

Dr. Walter L. Carr, New York, reported a case of "Pyo-Pnemo-thorax."

Dr. Samuel S. Adams, Washington, reported a case of "Traumatic Aphasia; Scarlatina Anginosa; Croupous Pneumonia."

Dr. Henry D. Chapin, New York, read a paper entitled "Hyperpyrexia (cases)." Discussion by Drs. A. Seibert, A. Caillé, W. P. Watson, A. Jacobi, and H. D. Chapin.

Dr. J. Henry Fruitnight, New York, read a paper entitled "Sarcoma of the Kidney in an Infant (case and specimen)." Discussion by Drs. L. E. Holt, W. Osler, A. Jacobi, and A. Caillé.

Dr. George N. Acker, Washington, read a paper on "Lympho-Sarcoma of the Spleen." Discussion by Drs. W. Osler and S. S. Adams.

Dr. Augustus Caillé, New York, read a paper on "Sarcoma of the Supra-Renal Capsule in the Newborn," and presented a pathological specimen. Discussion by Dr. L. E. Holt.

First Day (*Afternoon Session*)—Dr. F. Gordon Morrill, Boston, read a paper entitled "The Immunizing Effects of the Antitoxin of Diphtheria."

Dr. L. Emmett Holt, New York, read a paper on "The Use of Antitoxin for Immunization."

Dr. Augustus Caillé, New York, read a paper entitled "Personal Experience with Diphtheria Antitoxin and Blood Serum Injections."

Dr. A. Seibert, New York, read a paper on "The Value of the Antitoxin of Diphtheria and its Toxic After-Effects."

The subject of the Antitoxin Treatment of Diphtheria was discussed by Drs. J. H. Fruitnight, W. D. Booker,

Wm. Osler, H. Koplik, W. C. Woodward, H. D. Chapin, J. E. Winters, and A. Jacobi.

Dr. E. M. Buckingham, Boston, read a paper entitled, "Cases Apparently Diphtheria, but in which the Diphtheria Bacillus is not Found." Discussion by Drs. A. Jacobi, F. G. Morrill, and A. Seibert.

Dr. J. Lewis Smith, New York, read by title a paper on "Tetanus Neonatorum."

Dr. Irving M. Snow, Buffalo, reported by title a case of "Tetanus Neonatorum."

Dr. M. P. Hatfield, Chicago, read by title a paper on "Infantile Tetany."

Dr. Floyd M. Crandall, New York, read by title a paper on "Tetany (two cases)."

Dr. Wm. P. Northrup, New York, read by title a paper on "Typhoid Fever in Infants under Two Years—Is it Frequent?"

Dr. A. Jacobi, New York, read by title a paper on "Scurvy."

Second Day (*Morning Session*)—Dr. B. K. Rachford, Cincinnati, read a paper on "Reflex Irritation as a Cause of Neurotic Disease in Children." Discussion by Drs. T. M. Rotch, L. E. Holt, and A. Jacobi.

Dr. L. Emmett Holt, New York, read a paper entitled "Inanition Fever in the Newly Born." Discussion by Drs. T. M. Rotch, W. S. Christopher, A. Jacobi, J. P. C. Griffith, and W. D. Booker.

Dr. A. Jacobi, New York, presented a case of "Pygopagus."

Dr. J. C. Wilson, Philadelphia, read a paper on "Gangrene following Scarlatina." Discussion by Drs. A. Jacobi and W. Osler.

Dr. A. D. Blackader, Montreal, read a paper entitled "Some Forms of Eruption Simulating Scarlatina."

Dr. Charles G. Jennings, Detroit, read a paper entitled "Scarlatinaform Exanthema."

Dr. Louis Starr, Philadelphia, reported several cases of "Scarlatina with Intensified Eruption and Poorly Marked Constitutional Symptoms."

Dr. A. Seibert, New York, read a paper on "Local

Treatment of the Skin in the Eruptive Fevers of Children."

Dr. J. P. Crozier Griffith, Philadelphia, discussed the subject of "Difficulty in Differential Diagnosis." Discussion by Drs. A. Caillé, H. D. Chapin, J. C. Wilson, J. Dorning, A. Jacobi, S. S. Adams, J. S. Fruitnight, A. H. Macdonald, G. N. Acker, and L. Starr.

Second Day (*Afternoon Session*)—Dr. Wm. Osler, Baltimore, presented cases of Adherent Pericardium in Children, with Enormous Heart Hypertrophy, Chronic Proliferative Peritonitis and Recurring Ascites.

Dr. Wm. Osler also presented specimens of Cardiac Anomalies: (*a*) Cor biloculare; (*b*) Pulmonary Veins opening into Right Auricle; (*c*) Imperfect Ventricular Septum in a Man aged 45 years.

Dr. George N. Acker, Washington, presented a case of Aorta arising from the Right Ventricle.

Dr. A. Jacobi, New York, presented a case of Patent Ventricular Septum.

Dr. W. S. Christopher, Chicago, presented a case of Fœtal Endocarditis in a Mal-formed Heart.

Dr. L. Emmett Holt, New York, presented a case of Cardiac Anomaly.

Dr. F. A. Packard, Philadelphia, presented a case of Cardiac Anomaly. Discussion by Drs. J. P. C. Griffith, W. Osler and A. Jacobi.

Third Day (*Morning Session*)—Business Meeting—The Council reported as follows: We recommend Montreal, Canada, as the next place of meeting, and the time May, 1896. As officers for the ensuing year, we recommend:

President, Joseph O'Dwyer, M.D., New York.

First Vice-president, James C. Wilson, M.D., Philadelphia, Pa.

Second Vice-president, Henry Koplik, M.D., New York.

Secretary, Samuel S. Adams, M.D., Washington, D. C.

Treasurer, Charles W. Townsend, M.D., Boston.

Recorder and Editor, Floyd M. Crandall, M.D., New York.

Member of Council, A. D. Blackader, M.D., Montreal.

Delegate to Congress, A. Jacobi, M.D., New York.

Alternate, Thomas M. Rotch, M.D., Boston.

Committee of Arrangements, Samuel S. Adams, M.D., Washington, D. C.

As new members, A. H. Wentworth, M.D., Boston; R. G. Freeman, M.D., New York.

We present the resignation of S. C. Busey, Washington, D. C.

We recommend that the papers read at this meeting be published in the ARCHIVES OF PEDIATRICS, that journal to furnish the Society with two hundred bound copies of the transactions.

Upon motion, the report of the Council was adopted by the Society.

The Treasurer's report, together with books and vouchers, was referred to Dr. Jennings for audit. It was found correct and accepted.

Dr. T. M. Rotch offered the following resolution, which was adopted: "The American Pediatric Society wishes, before leaving Hot Springs, to express, through Dr. Chapin and Dr. Bradt, to the Hot Springs Company, their appreciation of the courtesy with which they have been treated during their visit at the Springs. They return their sincere thanks for the comfortable quarters which have been provided for them, and would tender their acknowledgements of the accommodation provided for them by the C. & O. Railroad Company to the company's officials."

Dr. F. Gordon Morrill offered the following resolution, which, after some informal discussion, was adopted: "Resolved, that, in the opinion of the Society, the evidence thus far produced regarding the effects of diphtheria antitoxin, justifies its further and extensive trial."

Upon motion of Dr. Caillé, the Secretary was authorized to publish this resolution in a half dozen of the leading medical journals of this country.

Dr. John Dorning, New York, reported a case of Rupture of the Bladder, and presented a specimen.

Dr. Augustus Caillé, New York, read a paper entitled

"Tapping the Vertebral Canal in the Lumbar Region." Discussion by Drs. F. Forchheimer and F. A. Packard.

Dr. Dillon Brown, New York, presented a New Extractor for the removal of Intubation Tubes.

A discussion on the Characteristic Features of the Recent Epidemic of Grippe of '94–'95 was participated in by Drs. L. E. Holt, A. D. Blackader, J. P. C. Griffith, J. H. Fruitnight, J. Dorning, F. G. Morrill, A. Seibert, A. Caillé, E. M. Buckingham and W. C. Woodward.

Upon motion, a resolution was adopted, thanking the President and Secretary for their efforts which had resulted in making this such a successful meeting.

The meeting then adjourned.

A PEDIATRIC POEM.

BY F. FORCHHEIMER, M.D.

INFANCY: OR THE MANAGEMENT OF CHILDREN.

A

DIDACTIC POEM,

IN SIX BOOKS.

THE FOURTH EDITION.

BY HUGH DOWNMAN, M.D.

EDINBURGH, 1788.

Such is the curious title of the curious little book to which I desire to call your attention. It is not a rare thing to find physicians who devote their leisure moments to the more intimate acquaintance with the muse; but it is rare to find one who has succeeded in causing Æsculapius to mount with Pegasus into ether. Most curious of all, is the fact that "Infancy" should have been chosen as a subject of poetical inspiration, to be invoked as follows:

> "O daughter of Philosophy; not Him
> Of gesture arrogant, and brow severe,
> Whose sullen, metaphysic eye, inwrapt
> In darkness, never deigns a cheerful smile
> To dissipate the gloom; but Him who leads
> Instruction by the Graces drest, attend!"

In this style does the author continue, alternately appealing to some God, Demigod or Hero, and anon to some mortal; using all figures of speech known to rhetoric, now and then appealing to some medical authority; but always with one object in view, that of imparting to his readers knowledge in regard to his subject. The book was very successful, at first being published in separate parts (1774, 1775, 1776), then completely, in 1788 (the edition before us), and a seventh edition in 1809, two years after author's death.

Hugh Downman was born at Exeter in 1740, was educated at Exeter and Balliol College, Oxford (B. A. 1763), and ordained the same year in Exeter Cathedral. After

being ordained, not finding his clerical prospects very bright, he went to Edinburgh to study medicine with Cullen, the Monro's, and Joseph Black; he remained for six years, and then completed his studies in London with the Hunters (John and William), and William Hewson (all of whom he mentions in the book), beginning the practice at Exeter in 1770. He had to give up the practice in 1778 on account of bad health; but resumed it again in 1790. During this retirement he published three tragedies, two volumes of poems, and was one of the translators of Voltaire's works. He continued in practice from 1790 to 1805, and died in 1807 at the age of sixty-seven. We have then before us a man of liberal education, not uncommon during the period in which he lived, who had exhausted the learning of two of the liberal professions, began the practice of medicine at the age of thirty, yet practiced in all for twenty-three years; and who was besides a most successful, amiable man and practitioner, and an author of some note, as is attested by Isaac D'Israeli, and evidenced by the success of his works. Living in the reign of George III., he was a cotemporary of Samuel Johnson, Goldsmith, Gray, Garrick, Sir Joshua Reynolds, and a host of others, all imbued with the same spirit of learning, and all moving in the same literary orbit, as is best attested by that greatest of biographers, Boswell. In those days, a learned physician knew more of poetry than of medicine—because there was less to be known of the latter than the former, and a mistake in the quantity of a Latin quotation was of far more importance than an error in a prescription. The daily meetings at the Mitre, the Turk's Head, or by whatsoever name the coffee-houses were called, were very conducive to the development of wit, and the discussions held at those places not a little favorable to the accession and imparting of knowledge. During the times of war and turmoil for England, the period of our American Revolution, when great men in both countries were coming to the front, Downman practiced medicine and wrote poetry.

"Infancy" is written in six books, in iambic pentameter, blank verse. The author begins with the invocation be-

fore quoted, and proceeding with his verse, soon launches out against "the pernicious custom of giving children some drug soon after they are born," preferring colustrum, in the following words:

> "Know the first efflux from the milky fount
> Is Nature's chymic mixture, which no power
> Of Art presumptuous can supply; this flows
> Gently detersive, purifying, bland;
> This each impediment o'ercomes, and gives
> The young, unfetter'd springs of life to play."

He next proceeds to show that the best food for children is mother's milk; and, curiously enough, uses one of the same arguments against those mothers "lost in pleasures, in the round of modish life and dissipation gay, misnamed polite," that is sometimes still employed, as follows:

> "She who refuses to her young one's life
> Her swelling bosom, each returning year
> Conceives and each returning year sustains
> The pangs of childbirth."

Then, after awhile, having shown that there are reasons why a mother cannot nurse, he adds:

> "Let my lays
> Direct thy choice for the momentous task,
> Whom to retain, what parent to adopt,
> For thy unconscious young one."

He claims that not only the body, but perhaps even the soul, may depend upon the choice of a wet-nurse; and proceeds to point out what qualities are to be looked for in the choice of one. She should be from the country; she must heed the "laws of matron-like sobriety;" her fame must be "from all suspicion clear," and she must, in all respects, be a good mother, wife, and housewife. She must neither be too young nor too old; for, if the latter,

> "The flexile vessels, which convolved in maze
> Wrapped within maze, secrete the purer streams,
> Their office will more sparingly perform,
> Or less nutritious particles supply."

He continues to draw a picture of poetic loveliness, of a perfect wet-nurse, which hardly conforms with the real conditions in this century. The advice is then given to permit the child to be taken to the wet-nurse in the coun-

try, even without its mother, for the city air is dangerous to children, being, as the author puts it,

> "Th' unwholesome atmosphere, gravid with seeds
> Of latent sickness, suffocation fell,
> Angina, apthous sores, eruptions dire,
> Pertussis fierce, and squalid atrophy."

From this, we may draw the conclusion that, at the time the book was written, the custom still so common in France, of sending children into the country to be brought up, also existed in England. The wet-nurse, in order to fulfill her functions properly, must be kept upon her usual diet, and allowed her own habits. To the latter subject, in general, he devotes the remainder of the first book.

In book the second,

> "What aliment the tender babe requires,
> How best sustained, the muse proceeds to sing."

He holds that as the lamb, sporting o'er "the grassy turf," and the patient ox, "who turns, sweltering, all day, the stubborn glebe," have thriven on milk, why should "the infant cease to thrive, supplied with this Nepenthe?" In regard to the times of feeding, he sensibly leaves this to experience, but advises no food during the night. The lioness leaves her young to go for her prey during the night, and the lion-cub grows up to "hereafter reign lord of the forest;" but if the baby cries, "unalarmed sustain a few short trials; bear unmoved the shock at first; indulged not, he will fret no more." The importance of giving rest to the digestive organs, and the necessity of much sleep to the infant, is insisted upon; and after two months some other food besides the milk is permitted. Fortunately for Downman's patients, he does not know anything about Korownin or Zweifel; and the pancreatic ferments are a *terra incognita* to him; so he advises farinaceous foods. He prefers

> "Bread, well fermented, unadulterate,
> With deleterious alum; this with milk,
> And with the limpid element decoct."

After nine months, comes the time of weaning—not suddenly, but gradually.

"And ere the stream maternal be refused,
His taste to different nutriments incline."

And now comes the choice food during and after weaning. He warns against exclusive vegetable food, as producing "tottering rachitis," or "slow-consuming tabes," or the "tortuous worm," which "multiplies his noisome produce." The food must be mixed, "herb, root, seed, and animal," a truth the anatomist plainly demonstrates." Firmer meats must not be used.

". . . till the rising teeth
Spring from their latent seeds, and deck the mouth,
In rows of clearest white,"

because the fibres will become impacted, and because the salivary glands will not emit "their needful liquid." It is better to give soup, combined with "the generous gifts of Ceres," and the "pearly grain from Carolina."

It seems that Pediatricians had their troubles in the matter of feeding in those days as well as now. It was easy to choose the food, but how difficult to have directions carried out!

"Wilt thou treat thy child by their opinion,
Whose advice thou wouldst not follow
In one act beside?"

he asks. How natural all this seems; and what an excellent way of putting the whole question. In the apotheosis he glorifies woman, enjoining her to

"Go, bless thy husband with a numerous race,"

i. e., after weaning the baby—in a manner *almost* satisfactory to the defenders of women's rights.

The next book opens with an exodium to Cullen, worthy of one to Hippocrates. He continues the subject of feeding, prescribing the same food as above for twelve months more, and then

"His strength increased, his more elastic limbs,
By constant motion exercised; his teeth
Given for utility, not show, demand
Food more substantive."

The advice is given to consult the "child's unvitiated taste;" and on this subject he grows eloquent, even hinting that of gynecology "the skillful muse, if so inclined

could sing." But the first conclusion is to remove "each high seasoned dish;" "each sauce impregnate with the seeds of fire, each spice."

> "Nor less he shuns
> Destructive Bacchus; why, then, will his sire,
> By frequent repetitions, strive to o'ercome
> Nature's dislike?"

Downman is not an abstainer; he uses alcohol at the proper time and medicinally; "but childhood needs no foreign aids to stimulate the brain." The child should have one meal of meat and vegetables; the meat should be of young animals, not of those "stall'd and cramm'd, by filthy sloth and gluttony," and prepared in the simplest manner; of these, with bread, the child can eat until "hunger be sufficed."

> "All things which housewife art with care preserves,
> Acid, or salt, or saccharine; all cates
> Of unfermented flour composed, or those
> Of fulsome sweetness and enriched with wine."

He again comes back to water as the drink of children, and claims that the Indians succumbed to "Circean charms, finally gave up their "paternal fields," and have gone on to extinction, the few remaining being corrupt, European cups having taught them every European vice. All fruits should be allowed children: berries, grapes, melons, and pineapples; exceptions, in that they must be used cautiously, are nuts, and such fruits as ripen after being picked, as the shaddock, pomegranate, and orange. After the child has become four years of age, he must conform to the laws of social life, *i. e.*, stated hours for meals; he must have the heavy meal in the middle of the day, described before, and for breakfast and supper, "fresh-drawn broths, and milk in various forms, with rice or other farinaceous grain inspissated." The author now goes on to pay his tribute to the didactic muse, mentioning many devotees, Akenside, Armstrong, Beattie, after which he begins the next book with an address to Mr. Codrington, evidently his own physician, who administered drugs to him in vain. It will be remembered that for some time

Downman was ill, and it seems the didactic lyre was not touched during this period.

The subject of the next book is clothing, heat, and cold. He gives us here his notions of the cause of the first inspiration, due to the rushing in of the air into the lungs through their own exertion:

> ". . . the circulating blood
> Alters its course, thro' channels unessayed,
> Impelled, whose first resistance haply claim
> Exertions of the laboring heart, quick, strong,
> If not convulsive, yet irregular."

The infant, when newly born, is "impassive" to cold, and he claims that among savages the baby might, "unclothed," "brave the freezing atmosphere," but he does not recommend this method of treatment to the "Daughter of Briton" for her child. The baby is to be dressed loosely and comfortably, without pins, and, above all, not to be swathed; nor, afterward, to be laced. Speaking of the care to be given children as to cleanliness, and the slovenliness of maids, he gives the following for intertrigo:

> "Nor is theirs
> The babe, who, smarting from their sloth, with nerves
> Keenly alive, by the corrosive sting
> Of acrimony pierced, tormented shrieks,
> Or moans incessant."

We meet the popular view, that it is not good for a child to sleep with an old person, because the baby loses heat to "warm the shrivell'd dotard." The clothing must be changed with Sirius or Aquarius, exceptions being made for weak or sick children; and a cold bath being given. The book ends in descriptions of all kinds of waters that may be used medicinally.

The next book begins with addresses complimentary to Monro, the Hunters, Hewson, and Black; and has for its subject that of exercise. The child is to be allowed to do as it pleases; no harm can come from premature walking, because a wrong posture will be corrected by uneasiness, "nor will his feebleness permit the force inducing harm, so strictly to his weight proportioned." Cradles must not be used, and the "untoward swing, the go-cart, and the leader," should be "doomed to oblivion," or to "some

museum's nitch devote." After having traced exercise and its effects through the varied stages, he begins to inveigh against the teaching of children "by rote" of "sonorous trifles, useless, and to him incomprehensible;" but evidently does not know the physiological reason for this good piece of advice. The book concludes with a supposed fragment from Hesiod on the origin of exercise.

In the last book we find the author disclaiming any attempt at description of disease, or recommendation of remedies. This, as he says, is unfit for the muse, and he leaves it "to some Medicaster, who, the quill dext'rously wielding, aims at vulgar praise;" a sentiment and a sentence that might even satisfy those of us who are most pronounced in our views on newspaper medicine. He contents himself, rather, with endeavoring to remove false opinions on the part of the mother, regarding disease and the seeking of advice, when "to invoke superior wisdom's aid." First: As to diagnosis, he shows that this is objective in children, and, to the adept, the signs are just as intelligible as they are in the adult, mentioning the cry, the position of the muscles, the breath, movements of the eyes, the face, the pulse, the skin, the condition during sleep and while awake, and other signs. He next warns against the use of remedies in the hands of the unskilled; mentions the fact that, as nowadays, children are suffered to have simpler remedies than adults, therefore require simple treatment, which might be construed as the prototype of the modern argument advanced in favor of homœopathy, for the treatment of children's diseases, but he adds, he "cannot but decry the unsound opinion which, for all alike, one favorite mode of practice recommends." In etiology, it is best to quote the author, at least partially:

"Acidity
Some only blame; and some, the sting severe
Of acrimonious humors. These accuse
The noisome worm, however hid from sight.
Those, as exciting fever, reprobate
Naught but the growing teeth. Repletion, some,
While others dreadful fits survey within,
Or e'en pretend to trace them in the smile
Of downy sleep. Nor women solely err."

How strange that the fight, still going on on some of these lines, should have been already so clearly defined by Downman.

In derangements of the stomach and bowels, he would not deny the mother the privilege of giving the child some Indian root, or "some useful antimonial," or some magnesia, or, "joined with this, more strengthening rheum, from Siberian wilds, or Turkey's region brought." But further than this she ought not to go. He warns the mother not to entrust the child to ignorant midwives or nurses, otherwise she will have occasion for remorse. He next shows the value of inoculation, it being a veritable triumph of science; praises Montague, and decries Pope for daring to censure her "with malicious spleen and meanly-coward soul." It might be of value to have the next lines published, for the benefit of the anti-vaccination societies, for they show, what their members seem to forget, how universal was smallpox, and how impossible to escape it in the days when even inoculation was considered a boon.

Some contra-indications for inoculation are mentioned, *i. e.*, not before dentition, nor during the same; not during the Winter, nor in the height of Summer. Jenner is not mentioned; his book was not published until ten years later; but it seems strange when we reflect that during the twenty years preceding it Jenner had been experimenting with vaccination, at the time being a friend of the Hunters, that Downman should thus appear to have had no inkling of the discovery of Jenner.

If we disregard the literary value of this book, there remains for us both an insight into the history of our subject, and also into the nature of the man who wrote it. The literary part does not appeal to us of the present day, any more than do the poems of Samuel Johnson, although in both will be found the evidences of astounding learning of that especial kind only exceptionally found among the physicians of the present day. As far as the historical development of our subject is concerned, the author has, unfortunately, taken up more the hygiene of infancy and childhood; but it must be admitted, that

whether or not his views were those that were current in his day, they were, although incomplete, pretty sound in the main. I do not here offer any apology for the cursory manner in which I have dealt with the little book, my object being mainly to bring to your notice some of its salient points.

Let us compare, in some of these points, several of the most popular books on children's diseases of the period in which Downman lived, and this will give us the best idea of Downman's independence of thought, and, possibly, originality. The most widely read book of that period was by Nils Rosen von Rosenstein, first published in Swedish in 1771, translated into English, 1776, into German in 1786 (other editions 1787, 1794, and 1798); into French in 1778 (second edition 1793); into Italian in 1780 (second edition 1783). This author is, for his time, quite sound in his ideas of artificial food; makes a distinction between boiled milk and raw milk, and even advises barley water as an admixture, or when the child is constipated, oatmeal water. But observe his directions for nursing the child: It must be nursed when hungry, and this can be determined by (I translate from the German edition of 1774):

I.—If the child has not nursed for several hours.

II.—If it directs its eyes upon the nurse and follows her wherever she goes.

III.—If pleasure beams from its eyes whenever the nurse uncovers her breasts.

IV.—If the child sucks at the nurse's finger, which must first be cleaned whenever she puts it into the baby's mouth.

Again, note his signs of teething and its dangers, among the former, swelling and redness of the tonsils, the eyes and cheeks; among the latter, fever, sleeplessness, convulsive movements of the face, general convulsions (called der Jammer by the German translator), finally somnolence and death.

In order to facilitate teething, he uses a wolf's tooth, or any other hard substance, rubbing the gums with honey, syrup of violets (Viola pedata), syrup of Althea, good olive oil or oil of sweet almonds, unsalted marrow, fresh butter, fresh brains of rabbits or calves. As a last resort, he has

the gums lanced, but care must be taken not to leave the least thread of tissue over the teeth, as otherwise it will be for naught. His last admonition, however, is one worthy of mention: "That if a child becomes ill, having twenty teeth, we should not ascribe the cause to teething, as it does not get any more teeth before it is seven years old." He has a proper idea of the nature of colustrum; not so Schaeffer (the translator of Armstrong), who gives the following to every newly-born child:

℞

Syr. de Cicor. c. Rheo..... ℥ iss
Mann. laxat. Oxymell. Scill.....aa ℥ ss

to which he adds Vinum Antimon. Huxh., if they rattle very much, until they are thoroughly cleared out, "both from above and below."

Again, compare Downman with Armstrong, who also wrote a very popular book (London, 1777 and 1873), and translated into German by Schaeffer, 1786 and 1792. Armstrong himself was rather judicious, but Schaeffer was more afraid of catching cold than we are of bacteria. He does not want children to be dried during the night, certainly not unless there is a fire in the room; although he permits the children to be bathed twice a week, in lukewarm water, to which some wine is added. After the baby is three months old, cold water can be used. The windows of the nursery must be open during the day time, and the doors at night. The therapy consists in all cases of Moliérés,

Seignare, vomitare et purgare
(Blood-letting, antimony and rhubarb.)

We must, furthermore, remember that John Hunter (1772) was the man who lanced the same gum of a tooth ten times, and ascribed most diseases of children to teething, first opposed therein by Armstrong, and that Downman was a most devoted friend and admirer of the Hunters, of whom he says, "dear to science, to your country dear, deserving public fame and private love." In view of these facts, it certainly speaks very highly for Downman's independence of thought and originality of

observation not to have followed the teachings of this illustrious man.

In conclusion, we must certainly be willing to admit that Downman was very much in advance of his time. Original in thought, certainly original in expression, and fertile in experience.

SOME PHYSIOLOGICAL FACTORS OF THE NEUROSES OF CHILDHOOD.

BY B. K. RACHFORD, M.D.

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Reflex Irritation.

Reflex irritation is one of the most important etiological factors of the neuroses of childhood. Many able pediatrists in recent years have waged an active crusade against this proposition, which previously was thought to be one of the axioms of medical knowledge. While these men have not been able to convince the medical world that reflex irritation is an unimportant factor of neurotic disease, they have very much modified the view, which so long obtained, that reflex irritation was the all important factor in producing these diseases. In the proposition, as stated at the beginning of this chapter, I have taken position between these extreme views, and it will be the purpose of this paper, to show that the influence of reflex irritation in producing nervous diseases in childhood, has been as much underrated in recent years as it was exaggerated by earlier writers, who taught that almost every nervous disease was caused by some reflex act. It is a matter of common clinical observation that such neuroses as hysteria, incontinence of urine, night terrors, chorea, convulsions, fever and headache are etiologically related to some form of reflex irritation, and this relationship is not infrequently absolutely demonstrated, when removal of the reflex irritation cures the neurosis.

The common sight of reflex irritations, which are recognized factors of nervous diseases in children, are

the genito-urinary organs, the gastro-intestinal tract, the eye, the ear, and the nose. The importance of this subject does not end with recognizing that reflex irritation from all of the above-named sights are common factors of neurotic disease, but it is of equal importance that we should recognize that, as a rule, reflex irritation acts conjointly with other factors in producing the neuroses of childhood. It is a well-known fact that reflex irritation, of apparently a severe type, may exist without producing nervous symptoms. In such instances, the centre, which is the most important part of the reflex arc, is normal, stable, and not easily excited to discharge its stored up nerve energy. It is most important, therefore, that we should recognize the fact, that the reflex irritation, which excites neurotic disease, is made potent by reason of its connection with an abnormally irritable reflex centre. In previous chapters, we have studied the influence of heredity, sex, age, environment, and various blood conditions, in producing an increased irritability of nerve centres; and it is chiefly with the aid of these factors of neurotic disease, that reflex irritation can produce such a wide range of nervous symptoms. The study of this subject embraces, therefore, not only how each of these factors may act in producing nervous symptoms in children, but it must also inquire into the inter-dependence and relationship of these factors in producing these symptoms.

The fact that reflex irritation is commonly associated with other factors, does not in the least diminish its importance as a factor of neurotic disease, since the removal of the reflex excitant very commonly cures the neuroses, even though the other factors remain, and since our best efforts at removal of other factors of neurotic disease, as a rule, are futile for good, as long as the reflex excitant remains to constantly excite the nerve centres. The explanation of these clinical facts is, that reflex irritation does not act simply as an excitant in discharging nerve force from irritable centres, but it also acts by keeping up the irritability of these centres, and if long continued, by producing changes in the nerve centres,

recognizable under the microscope, which make these centres more irritable and more susceptible to reflex excitation.

If this be true, then, reflex irritation at once assumes a commanding position among the factors of neurotic disease in children; such a position, as in recent years, has not been accorded to it, and it is the special purpose of this chapter, to replace reflex irritation in the high position which it merits among the factors of neurotic disease in children; in that position, which it formerly occupied, and from which it has been unjustly removed.

The microscope has gradually revealed to us the fact, that all cellular activity is accompanied by definite chemical and morphological changes in the cell itself. The tired cell differs from the rested cell, not only in morphological changes, which can readily be noted in nucleus and cell protoplasm, but also in the reaction of both cell, protoplasm, and nucleus to coloring matters.

The changes which result from the functional activity of cells may be called fatigue changes, and it is evident, that the longer the cell is worked, the more marked will be these changes. It is also a physiological fact that fatigue changes in the tired cell will disappear after a period of rest, and the cell will again be found morphologically and chemically a rested cell, but it requires a longer period of time for a cell to return to its rested condition than it does for the same cell to tire under ordinary work.

The fatigue changes, resulting from the functional activity of glandular epithelium are, as a rule, very pronounced. These changes, while not the same in all gland cells, may be noted in the shrunken condition of both nucleus and cell protoplasm, and in the changed reactions to coloring matters of both nucleus and cell protoplasm. Fatigue changes in the tired muscle cell are also shown in the shrunken and vacuolated condition of its protoplasm. And both the tired muscle cell and the tired gland cell are only restored to their rested condition by a period of prolonged rest—the period of rest required being considerably longer than the period of activity.

The nerve cell, like the gland and muscle cell, shows marked morphological and chemical fatigue changes. C. F. Hodge, in a very clever piece of work, has shown that definite changes occur in the nerve cells of the brain and spinal ganglia of certain birds and bees as a result of their normal daily activity. He compared the nerve cells of sparrows and swallows, shot in the early morning, with the nerve cells of sparrows and swallows, shot in the evening, after a day of hard flight. Experiments of this kind on birds and bees invariably showed fatigue changes in the nerve cells tired from the day's work. Hodge also found definite changes to occur in the spinal ganglion cells of the frog, the cat, and the dog, under electrical stimulation, and these changes were very similar to the changes which he had observed to result from the normal daily activity of nerve cells.

These fatigue changes in the nerve cells, whether resulting from normal daily activity or electrical excitation, are as follows :

Nucleus was "much smaller, and a jagged, irregular outline. It took a darker stain, and lost its reticular appearance."

Cell protoplasm "did not stain so readily, and was much shrunken. In spinal ganglia it was vacuolated."

Hodge also observed that the nerve cell recovered much more slowly than it tired, and that the recovery of the nerve cell might be represented by a curve, quite similar to the curves obtained by Mosso and Lombard, for the muscle cell in its recovery from fatigue. He concludes that "individual nerve cells, after electrical excitation, recover if allowed to rest for a sufficient time, but the process of recovery is slow. From five hours stimulation, recovery is scarcely complete after twenty-four hours' rest."

The changes above noted in nerve cells, as resulting from electrical stimulation and normal fatigue, have a plain bearing on the study of the changes which occur in the spinal ganglion from reflex irritation, since reflex irritation can do nothing more than greatly exaggerate the functional activity of these cells, and must, therefore,

result in changes within the cells similar to those above described.

Satovski, in a careful research on "Changes in Nerve Cells Due to Peripheral Irritation," has made an important advance in our knowledge of this subject. He irritated a peripheral nerve by ligature, and thereby caused a peripheral, but not a central, degeneration of the nerve. In this way, he produced a chronic reflex irritation of that portion of the cord to which this nerve belonged, and on microscopical examination of the cord at this point, he found on the injured side, using the uninjured side for a control, many cells exhibiting great vacuolation, and shrinking of the protoplasm from the capsule. The nuclei of these cells were oval instead of round, they stained easily, and were sometimes so much shrunken that they were zigzag in outline, and left a space between the protoplasm and the nucleus of the cell.

Mrs. Ternowski, in a research on "Changes in the Spinal Cord from Stretching the Sciatic Nerve," found changes very similar to those previously noted by Satovski.

From the observations quoted, it is plainly evident that chronic reflex irritation can produce very marked changes in the nerve cells of the spinal ganglia, and that the longer and more violent this irritation is, the more pronounced will these changes be. It is also plain that a considerable length of time must be required to restore to their normal condition, cells which have been subjected to reflex irritation for months and years. It has even been noted that nerve cells, under electrical stimulation, can be so exhausted, that the nuclei will entirely disappear, and the cells be unable to recover their normal condition, even after the removal of the stimulus, which produced the change. Here we have an explanation of the ofttimes slow recovery of an irritable spinal cord, after the removal of the reflex cause, which brought about the irritability. In the application of these facts to clinical medicine, we must remember that the spinal cord has but two functions, viz.: conduction, and reflex action. We must also remember, that a reflex irritation of an afferent

nerve, carrying impulses to any one of the many special reflex centres of the cord, does not confine its morbid influence to that centre, but, by reason of the physiological law of "overflow of reflexes," the impulse spreads up and down the cord, producing changes in the cells of adjacent centres; and if the reflex irritation be severe and long continued, the impulses may spread throughout the cord, involving all its centres, and producing a general spinal irritability, and in this way predisposing the individual to all kinds of reflex nervous diseases.

In some recent experiments made upon rabbits, I have been enabled to demonstrate, that a chronic reflex irritation can produce a most extreme irritability of the nervous centres in the cord of this animal. In these experiments, the abdominal cavity of the rabbit was opened, and the large intestine stitched into the abdominal wound. These rabbits quickly recovered from the operation, and for a week or ten days seemed normal in every way. At this time the reflexes, which, in the normal rabbit, can scarcely be brought out at all, began to be very perceptible. In these experiments, the knee jerk, and a reflex which is produced by letting the finger slip over the anterior superior spine of the ilium were studied; and it was found that from the tenth day onward, there was an increase in the reflex excitability of the cord, as determined by an increase in the above-named reflexes. The reflex excitability of the cord continued to increase for about six weeks; after this period of time, the cord was so excitable that it was impossible to make out whether the excitability was increased or not, since a slight touch would produce a maximum reflex.

These experiments clearly show that chronic reflex irritation, unassisted by any other cause that could be made out by careful post-mortem examination, can produce in the rabbit a most extreme irritability of the spinal motor centres. The post-mortem examination of these rabbits, one of which was killed three months after the operation, showed no evidence of peritonitis or other disease, other than the attachment of the large intestine to the abdominal wall. The spinal cord of the rabbit killed at the end

of the third month was examined microscopically, a number of sections being made from the lumbar and dorsal regions. In all of these sections changes in the ganglion cell, similar to those described by Satovski, were found. The nuclei were irregular in size and outline; many were oval and many had a jagged outline; many of the nuclei were small and had a shrunken appearance; and all of them took the stain more deeply than does the rested (normal) nucleus. The protoplasm of the cells did not take the stain as it normally does, and in many instances it took the stain so faintly, that the outline of the cells could not be made out. In some instances, only the small, deep-stained nuclei were visible.

In the above observations, we have not only a physiological, but also a morphological explanation, of how and why a chronic reflex excitation may be an important factor in producing a general spinal irritability, and we have also a sufficient explanation of the fact that the removal of the reflex cause, which has been acting for years in producing spinal irritability, may not at once be followed by the cure of the spinal irritability, and that it may even require years of comparative rest for the irritable spinal centres to become stable (normal), even after the removal of the reflex cause which produced the irritability of these centres; and these observations also justify the belief that reflex irritations, acute and chronic, are among the most important causes of neurotic disease in children.

In the study of the influence of reflex causes in producing the neuroses of childhood, one important question must be answered, viz.: why is it, that chronic reflex irritation is so much more important, as a factor, in producing nervous diseases in children, and in girls, than it is in man? The oculist will testify that eye strain is a much more potent factor in producing headache, chorea, and general nervous irritability in children, and in young women, than it is in men. The surgeon will testify that diseases of the genito-urinary apparatus, which produce the most profound nervous symptoms in women and children, have little or no such influence in men. The physician will testify that irritation from diseases of, or foreign

bodies in, the intestinal tract will produce convulsive and other nervous disorders in children, while the same conditions have little influence in producing nervous symptoms in man. The gynecologist is prone to believe that disease of the female generative organs is the most important of all the reflex causes of nervous disease; and every clinician has observed the predisposition to nervous disease, which accompanies the growth and functional development of these organs. In fact every department of medical science lends testimony to the fact, that age and sex are among the most important of the predisposing factors, which assist reflex irritation in producing neurotic disease; and the reason for the potency of reflex causes in producing neurotic disease in children and girls is not altogether obscure.

The following facts may be noted :

1. *In children*, (*a*) Reflex causes are more frequent than in adults, (such for example as uncorrected eye-strain, adherent prepuce, balinitis, etc.). (*b*) The nervous system of the child is more irritable and unstable by reason of its incomplete functional development. (*c*) The inhibitory control of higher nerve centres on spinal reflex movement is feebly developed in the child. (*d*) Blood changes are much more common allies of reflex disturbances in producing nervous diseases in children than they are in adults.

2. *In girls*, (*a*) Reflex causes are very much more frequent than in boys or in female adults, (the approach of puberty, with the functional development of ovaries and uterus, is a source of constant reflex disturbance; after the full functional development of these organs, the reflex excitation is intermittent and confined to a period just before and during a menstrual period). (*b*) Inhibitory control of the spinal motor centres more readily gives way in young girls than in boys of the same age. (*c*) The social conditions and habits of life of the young girl predispose her to nervous disease. (*d*) Blood changes, which produce nervous irritability, are very much more common in girls than in boys.

The above are some of the factors which assist reflex

cause in producing neurotic disease in children, and in young girls, and which have little influence in producing disease in male adults. In these observations, we have an answer to the question : Why does reflex irritation produce nervous disease more readily in the child and young girl than it does in the male adult ?

DISCUSSION.

Dr. T. M. Rotch : There is no doubt that we need to have our attention called more closely to the reflex conditions that arise in childhood. If we were more careful in regarding these symptoms, we might avert much suffering that possibly now arises from erroneous diagnoses. This paper could be discussed at any length, but the subject is too broad to enter upon this morning.

Dr. L. Emmett Holt : It seems to me that the constitutional symptoms associated with rickets should be mentioned. Given a rachitic child, the condition is such that a very small matter may give rise to marked disturbances. Such small disturbances as would not affect a healthy child will markedly affect rachitic children.

Dr. B. K. Rachford : I covered that part of the subject in a previous paper.

Dr. A. Jacobi : I look upon this paper as either an epilogue or prologue of a larger work, as the author did not take up rickets or any other special disease or condition. As far as rickets is concerned, the symptoms are not in the majority of cases the results of reflexes, but are due to an abnormal condition of the brain and meninges from an early period. In a large number of cases the brain suffers first. We have to deal with a disease of the nerve centres and not with reflex symptoms, therefore, I do not consider that example a very good one.

THE IMMUNIZING EFFECTS OF ANTITOXIN.

BY F. GORDON MORRILL, M.D.

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Before describing the results obtained from 438 immunizing injections of antitoxin at the Children's Hospital, I will briefly explain the reasons which have rendered such an extensive use of the serum necessary.

The policy of the institution has always been to decline to admit cases of such diseases as are generally regarded as infectious; and the building originally included but two small rooms for the isolation of such cases as might appear among the patients in the house. After a time (as might be naturally expected in any large congregation of children), endemics occurred, and larger, but (in the light of recently acquired experience) insufficient quarters were provided.

During the year 1894, cases of diphtheria occurred so frequently as to necessitate the closing of the hospital and disinfection of the wards, on three separate occasions, to the great inconvenience of all concerned, and with serious detriment to the usefulness of the institution.

It was thought at first, that the infection was introduced by the parents or friends of the patients; and blouses and disinfectant washes for the faces and hands of all visitors were prescribed. But in spite of these precautions, fresh outbreaks occurred, and we were reluctantly forced to the conclusion that the Klebs-Loeffler bacillus had installed itself as a permanent and most unwelcome guest within our walls, and stood in no need of an introduction.

Furthermore, we convinced ourselves that the chief source of trouble was confined to one ward, where grave defects of ventilation were discovered. Some time elapsed before this last conclusion was reached; for while cases of diphtheria were more frequent in this ward than elsewhere, the fact that a majority of the children were in the habit of meeting in the play-room, had led to such a distribution of the infection as to give rise to cases

in all parts of the hospital. The type which the disease assumed was seldom frank; children with coryza or slight tonsillitis and scarcely any constitutional symptoms, would perhaps fatally infect others, and in many instances repeated bacteriological examinations of the secretions alone showed when the trouble began and ended—no membrane or other clinical evidence of diphtheria being present at any time.

January 13th, 1895, there were nine cases in the infectious wards, four or five of which had been transferred from the house within forty-eight hours.

The question of closing the hospital for the fourth time was discussed, and it was decided to first try immunization with antitoxin, in the hope that this course might enable us to maintain open doors and go on with our work. The staff was so kind as to give me *carte blanche*, so far as the diphtheria was concerned, and within thirty-six hours, thirty-nine patients who remained in the house, and three nurses who were on duty in the contagious wards, received each an injection of 5 c.c. of the serum prepared at the Pasteur Institute of New York, according to the formula of Roux.

The apparent result of this first attempt was to instantly arrest any further spread of the disease. Patients in the contagious wards were disinfected and returned to the house as soon as negative reports of the cultures of two specimens, taken forty-eight hours apart, were received from the bacteriological laboratory of the Harvard Medical School. No patients were admitted with any suspicious symptoms in their noses or throats; and all new-comers received an injection of 5 c.c. on entrance. Specimens were obtained frequently from all patients, and reports of the cultures were all negative until January 29th, when a boy who had reacted perfectly well to an immunizing dose, was found guilty of harboring the Klebs-Loeffler bacillus, and was at once transferred to the contagious wards. The specimen from which this positive culture was obtained, was taken sixteen days after immunization; and while there was no certainty that the bacillus had not been present for an indefinite time in this particular case,

(through an oversight, no previous culture having been made) it was thought best to inject antitoxin again in all cases which had not been immunized within ten days. Cultures were now made at the Bacteriological Laboratory of the Harvard Medical School, of specimens from every nose and throat in the house, and negative reports obtained in every case but one—that of a boy who had been returned to the house from the infectious wards after two favorable bacteriological examinations.

A rule was now made that all new patients should be injected in the bath-room before being allowed to enter the wards for the first time, and the dose of antitoxin was increased to 10 c.c. for children ten years of age or over. I do not believe that the injections have been omitted or deferred a dozen times on account of the condition of any child's health, and I have seen but one instance in which danger was suggested by the use of the serum—a case which I shall refer to later on. The mere inspection of noses and throats was soon found to be a very slight safeguard against the introduction of the bacillus; for children with apparently normal mucous membranes were frequently discovered to have bacteriological diphtheria a day or two after entering the hospital, and emergency cases were often found to be in the same plight. One of the latter developed diphtheritic membrane; and while all this went to prove the reliability of antitoxin as an immunizing agent, bitter experience had rendered us timid, and the rules for admission were amended so far as to exclude all applicants until they had been reported as free from the bacillus, excepting cases of the greatest urgency. Meanwhile, all patients found guilty of secreting (and perhaps excreting) the Klebs-Loeffler were transferred to the infectious wards, there to remain until negative reports of their cultures should set them free.

No signs of the enemy were present again in any patient whose mucous membranes were free at the start, until February 15th, when a boy who had been twice immunized—the second time on January 29th—and whose cultures had always given negative results, was found to be infected. Injections were at once given in all cases

which had not been immunized within two weeks, and the rule established, to repeat them every fortnight.

March 12th, a patient who through an oversight had been given no antitoxin since February 16th, was found to have the bacillus; but we had now become quite accustomed to its presence, and so long as it had not been detected in any child who had begun with a clean record, in a shorter space of time than seventeen days after immunization, we felt pretty safe so long as the injections were regularly given every two weeks. The next day, however, a positive culture was obtained in the case of a patient who had been injected February 28th. This eclipsed any previous records, and showed that fourteen days could not be surely counted on, so the period allowed to intervene between the immunizations was shortened to thirteen days. Meanwhile an estimate of the applicants for admission whose cultures were positive, showed that over 20 per cent. had the bacillus in their throats or noses. Emergency cases came thick and fast (emergency is an elastic term from a surgical standpoint) and when the observation rooms in which such cases were kept (pending reports from the bacteriological laboratory), happened to be full, they went into the common wards. Some of these proved to have bacteriological diphtheria, and one developed clinical evidence of the disease. There is not the slightest doubt that many patients in the house were thoroughly exposed, aside from the infection present in the building itself. Our contagious wards were now full, and the question of continuing to admit patients, and allowing such patients as might present bacteriological but no clinical evidence of the disease to remain in the open wards (or even to be transferred to them from the contagious quarters) was discussed. I thought at the time, and I still think, that this could have been done with safety so long as immunization was regularly kept up. There had been but few days during the past month when the wards had been free from the bacillus either alone, or as a companion to membrane. A large majority of the staff agreed with me; but we refrained from pur-

suing a course which might injure the hospital by giving rise to distorted rumors.

So a vote was passed to the effect that every patient with the bacillus present, whose culture had not been tested by injecting a guinea pig, should remain in the infectious wards, and admissions to the hospital suspended; for if measles or scarlet fever broke out among the children, we should find ourselves badly crippled. Everything considered, I am sure that the staff is entitled to the credit of showing a considerable degree of deference to the somewhat freely expressed opinion of outsiders, who know but little about the actual situation. Fortunately the bacilliary tide began to ebb at this time, and we were spared the guinea pig test, which often consumes a fortnight's time, and may lead to no really definite conclusion in the end.

Things now went along smoothly until March 25th, when an unmistakable break-down occurred in a child who had been antitoxined on the 10th, and again (by mistake) on the 16th. Negative cultures had been obtained on the 4th and 19th, but the girl had perfectly well marked clinical diphtheria, and the diagnosis was confirmed by bacteriological examination. Within twenty-four hours bacilli, but no membrane, were found in two other cases which had been immunized on the 16th. But in spite of these exceptional cases (occurring as they did nine and ten days respectively after being injected) it was not thought best to shorten the interval between the immunizations, as I had good reasons for doubting the reliability of the serum used in these instances. April 4th, but two patients remained in the infectious wards, and as the service was becoming less active we no longer made surgical patients wait for bacteriological examinations before admitting them to the house. Two or three proved to be infected (inasmuch as the bacillus was present in their throat, and such cases must be regarded as infectious, no matter how robust their general health may be, until their cultures have been proved benign by the guinea pig test) and were allowed to remain in an open ward. The epidemic was on the

wane, the infectious wards were quite empty, and we did not care to reopen them. In short, we did now what we might have safely done weeks before, and for better reasons. No bad results followed this course, and I am sorry that it was not pursued at an earlier date. Children who had the bacillus but no symptoms requiring special care, might far better have remained in the house and passed their time in being cured of the affections they entered the hospital for originally, than have gone to the infectious wards and increased the work of the staff and nurses. Certainly nobody who is familiar with the conduct of children in hospitals — their close intimacies, the manner in which toys are used by all — can believe that the risk of infection would have been materially increased over what already existed if they had been allowed to remain.

An analysis of all the cases, shows that of a total of 438 immunizing injections given between Jan. 13th and May 13th, 109 were of Gibier's serum; 104 of Behring's, 74 of Aronson's, and 151 of the antitoxin prepared by the Mass. State Board of Health. The largest number administered to one child was seven. Many of these patients were under treatment for acute diseases at the time of injection: croupous and broncho-pneumonia, grippe, tubercular peritonitis, empyema, typhoid, or such surgical troubles as naturally find their way to a children's hospital. No special symptoms were noted as produced by the serum with regard to the existent diseases at the time of injection excepting in one or two suppurative hip cases, in which there was a temporary improvement in the appetite and general condition. In a few cases of desperate illness the antitoxin was omitted, or postponed until the patient's condition improved, but as a rule all fared alike. I have failed to observe any dangerous symptoms arise from immunization excepting one case — A boy, æt. two, with leucocytosis and a large spleen, upon whom two preceding doses had produced no ill effect, had a temperature of 105.4° F. and considerable œdema about the point of injection (given in the abdominal wall in this instance), and certainly appeared

very sick. Cold baths and brandy soon made him better, however, much to my relief. Of course the results of an analysis of our cases are by no means claimed to be conclusive. They are, however, sufficiently well based to permit their being regarded as suggestive. As a rule, the temperature goes up less than a degree a few hours after immunization, and in 75 per cent. of all cases this is all there is to be seen. Erythema around the point of injection occurred in twenty-three cases. In four it was very extensive, and closely resembled erysipelas — in one instance the child was isolated. The average duration of this symptom is three days ; in some cases it lasts only a few hours. It usually appears on the first day after antitoxin, and never later than the eighth. Urticaria occurred twenty-eight times. The frequency, severity, time of appearance, and duration of this symptom varies greatly with the brand of serum employed. That of Gibier (Pasteur Institute of New York), produced it in 22 per cent. on the (average) seventh day, and lasting (an average of) two and a half days. Behring's caused it in but one case, appearing on the eighth day and lasting three days. Aronson's gave rise to no urticaria. The serum of the Mass. State Board of Health produced in about 4½ per cent an eruption appearing on the (average) second day, and disappearing in a day and a half. This serum at present very rarely gives rise to anything cutaneous, although at first urticaria was of pretty common occurrence. In three instances the erythema was papular, and very closely resembled measles. In two instances an eruption like scarlet fever was present. Occasionally a child whose skin remained clear after the first or second or third immunization, broke out with an erythema, or an urticaria after a subsequent injection. The same brand of serum may produce an urticaria, an erythema, or no skin eruption whatever in the same subject, as proved in more than one instance where repeated injections were given. Pain (at times intense) was noticed about the point of injection in sixteen; œdema in seven; axillary or inguinal glands enlarged in three; general malaise (in one instance a mild delirium) in three. Pain in

the articulations in less than 1 per cent. Nausea, with or without vomiting in 3 per cent. Diarrhœa (emphemeral) in less than 3 per cent. Increased frequency of micturition was noted in rare instances. The urine of eighty-two children was very carefully examined with reference to the effects of antitoxin on the kidneys, and the result of 540 examinations may be briefly stated as follows: In 20 per cent. no change whatever was detected. Of the remaining 80 per cent., those which had been free from albumin previous to immunization, showed a slight trace —in most instances the slightest possible amount, which could be detected only when placed in front of a dark background. This within 24 or 48 hours after injection. In cases where albumin had been present before the use of antitoxin, there was a very slight increase of the amount. In no case was there any diminution in the amount passed, or any evidence of failure to eliminate properly. Repeated microscopic examinations revealed nothing more than an insignificant amount of renal irritation in any case, and when the albuminuria was produced by antitoxin, it disappeared in a period varying from two or three days to a fortnight.

With regard to the protection afforded by antitoxin, our experience has tended to show that the serum, when fresh, can be relied upon to immunize against anything resembling clinical diphtheria thirteen days, and very probably for a longer space of time. Moreover, in no instance was the bacillus detected in the nose or throat of any child who started with a clear record in a shorter space of time than that just mentioned. This last point (if eventually established) is of practical importance as showing that an immunized child is not only safe from diphtheria, but is also safe as concerns others for a definite length of time. I am by no means sure that daily examinations of cultures from every case might not have shown the fallacy of the theory; but the fact that quite numerous examinations were made, with the results described, certainly deserves mention. In the cases which broke down in eight and ten days after being immunized, the serum used had become decomposed. The color differed from that usually pre-

sented, but so slightly at the time of injection that it was used without hesitation. Forty-eight hours later it was of the color of milk.

Regarding the use of antitoxin for curative purposes, our experience, while decidedly favorable, has been too slight to warrant the expression of an opinion. Statistics at the Children's Hospital, if made up from the standpoint that the mere presence of the bacillus in the nose or throat constitutes diphtheria, would justify the extremely favorable and entirely fallacious statement, that our mortality has been less than 3 per cent. For of thirty-four patients who have been inmates of the infectious wards, only one died; and all of them received antitoxin—the great majority, however, never more than one small injection, for the purpose of immunization upon entrance, before the reports of their cultures had been obtained. Assuredly one might as well claim that the existence of the pneumococcus in the saliva implies the presence of pneumonia, as to call all cases which have the Klebs-Loeffler bacillus diphtheria. Equally absurd is it to treat such cases with antitoxin, unless some clinical evidence of the disease is present. I have convinced myself that full doses of the serum has no influence on the mere presence of the bacillus after it has once obtained a foothold. The more ardent supporters of the treatment will greatly endanger its reputation if they present claims based on statistics such as I have described. On the other hand, I do not doubt that equally enthusiastic opponents of antitoxin will bring forward abundant proof that it does no good whatever. I can well remember something of the kind being done in the case of salicylic acid, and kindred preparations, by conscientious men, who showed by apparently flawless statistics, that cases of acute rheumatism did better under the old treatment by alkalies; but the remedies whose merits they denied have stood the test of time wonderfully well, and if taken away from us to-day would be badly missed.

Results of the serum treatment, if they are to inspire confidence, must be based upon such cases as are clinically diphtheria, and the diagnosis of which is confirmed by

bacteriological examination. Care must be taken to exclude all cases in which a membrane, which to all appearances is identical with that of diphtheria is present, but which is due to the work of other germs. Instances of this sort are far commoner than was formerly suspected—I have observed four (two at the hospital and two in private practice) during the past six months.

In the present state of our knowledge, the Klebs Loeffler bacillus may be said to resemble an idle but extremely competent workman, who under certain unknown conditions may suddenly accomplish a wonderful task. He gives no warning of his intentions, and does not trouble himself to put on working clothes—at least none of a sort which can be recognized under the microscope.

Even such cultures as have every appearance of virulence may prove to be benign when tested, and when they look doubtful may promptly kill the injected guinea pig. Every active diphtheritic germ is undoubtedly a Klebs Loeffler, but every Klebs Loeffler is by no means an active diphtheritic germ. On the contrary it does not, as a rule, harm those who afford it shelter. Of thirty-four patients who have passed through our infectious wards at the Children's Hospital during the past six months, but seven have had anything resembling what used to be called diphtheria before the birth of the bacillus was announced in the journals, and two of these cases were caused by other germs. But I cannot doubt, that the bacteriologists who have given us so much of inestimable value during the past few years, will before long, extricate us from the dilemma caused by our uncertainty of the sanitary status of a person who has only bacteriological diphtheria. Until this knowledge is vouchsafed us, we must continue to regard such a one as a dangerously indefinite quantity; and in an institution like the Children's Hospital, this implies the absolute rejection of a large number of cases, and the disaffection of many others, who cannot be admitted until reports of their cultures have been obtained; for after such alterations shall have been effected during the coming summer as will render the building safe, and immunization is no longer a routine, no case can be permitted to

enter which is open to suspicion of harboring the bacillus.

Another thing: Are we justified in admitting a child on the strength of a single negative report? As to the reliability of these reports, there are defects in the present method of obtaining specimens for bacteriological examination, (and very probably in any possible method) which render occasional errors unavoidable. I do not wish to be understood as questioning the skill and accuracy of the gentlemen at the Bacteriological Laboratory who make the cultures. If there are no bacilli in the specimens handed in to them, we cannot reasonably expect positive reports; and I merely state an obvious fact when I say, that the wire used for obtaining specimens may be justly compared with a hook which is lowered into a dark pool in the hope of jigging fish. If the fish are plenty, there is a strong probability of success—if scarce, the chances are fewer. And whether they are plenty or scarce, the element of luck must be taken into account. Of course, if membrane is present and the wire pushed under the outer edge, there is but little probability of failure.

To arrive at an estimate of the frequency of errors due to the uncertainty of bringing away bacilli on the wire when they are present, I have taken the bacteriological reports concerning patients in the infectious wards, from whom specimens were examined at short intervals, and called such negative reports erroneous as are immediately preceded and followed by positive cultures Of two hundred and fifty-three reports, twenty-six were incorrect —a little more than 10 per cent. Under these circumstances I think two negative reports of specimens taken twenty-four hours apart should be obtained—nor can we then feel absolutely safe.

Some of the patients in the infectious wards were very slow in getting rid of their bacilli. One case was lodged and fed at the expense of the hospital for two months, for the sole reason that we failed to obtain two negative reports in succession. He was in robust health, and a particularly noisy and troublesome boy. Finally he was discharged, much to the relief of all concerned.

Various means were tried in cases of that kind to hasten the departure of the bacillus. Good results were finally obtained by atomizing strained lemon juice into the noses and throats six times per diem. Cases which had resisted equally frequent applications of peroxide of hydrogen yielded promptly to this treatment. It is not a pleasant procedure. Children do not like it—but neither does the bacillus. At first it occasions considerable irritation about the nostrils and upper lip; but tolerance is soon established, and the end justifies the means. Since finishing this paper (May 13th) a sufficient number of injections of antitoxin have been given at the Children's Hospital, to bring the total close to five hundred, and with no fresh evidence to alter the views which I have expressed. I think that the fact that we have not had a single abscess resulting from so many injections, speaks well for the careful attention to cleanliness on the part of the internes of the hospital whose good and painstaking work deserves mention.

PERSONAL EXPERIENCE WITH DIPHTHERIA ANTITOXIN INJECTIONS.

BY AUGUSTUS CAILLÉ, M.D.,

New York.

My experience in the management of diphtheria and croup extends over a period of eighteen years, with abundant opportunity for observation and study; and, as a result thereof, I have come to look upon diphtheria as one of the most easily preventable of infectious diseases, with decidedly unsatisfactory features as regards its treatment. Mild local disinfection and judicious stimulation have, in my hands, given better results in counteracting diphtheritic inflammation and sepsis than the routine administration of various drugs, although I am quite willing to acknowledge that Iron, Potassium Chlorate, Mercury, etc., are administered upon rational indication, and frequently with ultimate good results.

It was with profound interest that I hailed the advent

of an alleged specific treatment for diphtheria; and being fortunate in obtaining from abroad an early supply of the antitoxin, I have been able thus far to observe its action in forty-one cases of Klebs-Loeffler diphtheria, of which seven cases have had a fatal termination. These figures are given simply as a matter of fact, and not as a matter of statistics upon which far-reaching conclusions can or should be based.

The causes of death in the fatal cases were the usual ones: Sepsis with heart failure, broncho-pneumonia, acute nephritis, and downward extension of pseudo-membranes. Two of the seven were moribund at the time of injection; one boy, nine years old, died ten days after the injection, with pronounced nephritis, anuria and heart failure; one child, eleven months old, with diphtheritic croup, died a few hours after injecting and tubing, and three others died from broncho-pneumonia and sepsis, without appreciable manifestations of specific curative action on the part of antitoxin.

Of the thirty-four cases ending in complete recovery, thirty-two were treated with Behring's or Aronson's serum, two with serum from the Gibier Institute, New York.

In the majority of cases, one injection (600 units) was given; in one-third of the cases, two and three injections were administered. Judicious stimulation was carried out in all cases, and naso-pharyngeal irrigation was practiced in all cases, with salt water or mercuric bi-chloride 1-5000.

I will not take up the time of this meeting with a detailed history of these cases, but simply pick out a few to illustrate what I look upon as specific curative action of diphtheria antitoxin.

(*a*) In a child eighteen months old, afflicted with adenoid vegetations and very large tonsils, the nose, pharynx, tonsils, and uvula were the seat of diphtheria. There was also glandular infiltration, high fever, stupor, etc. Two injections of antitoxin were administered, the progress of the disease was arrested promptly, and the child was quite well after forty-eight hours. The Klebs-Loeffler

bacilli were still present three weeks after clinical recovery.

(*b*) A physician's child, nine months old, with pharyngeal diphtheria (mixed infection), recovered very promptly after one injection of Behring's serum. After five days of normal temperature, slight fever and urticaria were noticed, which persisted for a short time only. Subsequently, a retro-pharyngeal abscess developed, which healed after incision. In my experience, cases of true diphtheria in children at the above age are usually fatal.

(*c*) A girl of five years, with scarlet fever and pharyngeal diphtheria (mixed infection) received a full dose of Behring's serum, and showed no clinical evidence of diphtheria on the day following the injection. She was subsequently in bed for two months and very ill with nephritis and suppuration in various parts of the body, and would, in all probability, not have recovered if the diphtheritic process had lasted for any length of time.

The most convincing cases as to the specific action of antitoxin are, in my estimation, cases of diphtheria with "croup." I have seen four such cases recover after antitoxin without operative interference. These children were one and one-half, three and one-half, four, and five years of age. They were seen in consultation with experienced colleagues, the antitoxin injections were made in the evening for urgent stenosis, as a dernier resort before operative interference, which was agreed upon for the following morning, but which became unnecessary, owing to marked improvement in breathing.

Every experienced practitioner has seen cases of visible diphtheria, with croup, stop short of complete stenosis, and gradually get well without mechanical interference having been resorted to; but it will be admitted by the best observers that such recoveries are rare—moreover, such recovery is always slow. Such children are a source of anxiety for a number of days; membranes are expelled, improvement is followed again by a renewal of stenotic breathing, and so on for several days. In the cases here reported, the improvement was marked and permanent from eight to twelve hours after the first administration of specific treatment.

Serious ill effects from antitoxin have not been observed by me.

I have seen urticaria, erythema, and painful and swollen joints, with fever, develop in children from three to seven days after such treatment. Such manifestations were mild and disappeared without retarding convalescence. In a number of instances, albuminuria was present, but no conclusions can be drawn therefrom. Children in contact with diphtheria who were treated with an immunizing dose of antitoxin did not take sick.

Three exposed children of one family who received no prophylactic naso-pharyngeal irrigation, and no immunizing injection, all took sick with true diphtheria, and all recovered after antitoxin therapy. These cases will always be fresh in my memory, from the fact that they had been ordered by the health officers to remain in the sick room for many weeks after recovery from a clinical standpoint, and were deprived of the stimulating effects of fresh air and sunshine for a number of weeks, until swab cultures no longer revealed the presence of diphtheria bacilli.

This restriction is, in my estimation, of no practical value as regards diphtheria in densely populated districts, and I take this opportunity of publicly protesting against the enforcement of such measures by the sanitary authorities.

A great deal has been said pro and contra regarding the specific curative action of the diphtheria antitoxin serum. In adjusting the merits and demerits of a new treatment of such colossal importance to mankind, praise and censure are apt to fall wide of the mark. To those who, from insufficient data, loudly proclaim that they do not believe in BEHRING'S discovery, I would remark that we have before us for investigation no new theory of sudden inspiration, but the result of careful, patient, and painstaking biological research, extending over many years, undertaken by those best qualified to do the work.

Our clinical experience has so far upheld the claim made for the antitoxin of diphtheria as to its specific and curative powers, for a reduction of the mortality from diphtheria

is conceded by the vast majority of unbiased and competent observers.

We have in mercury, quinna, and the salicylates specifics of great value, but no one will be rash enough to claim for these drugs a positive curative action in every instance in which they are employed.

A specific for diphtheria or any other infectious disease may fail in cases of so-termed individual idiosyncrasy; it may be powerless in far advanced dissolution from an intense primary disease, or from severe complicating conditions, and still it may be a wonderful specific, with power to heal and power to cure.

In conclusion, I would state, as regards its application, that it is indicated in visible diphtheria and true croup in full doses. Also in scarlet fever and measles in curative doses, from the fact that diphtheria is a frequent complication in such diseases, and immunizing injections are indicated in all exposed children; and taking into consideration the possibility of ill effects from blood serum, it would be wise to use only the strongest preparations containing the largest number of antitoxin units in the smallest quantity of serum.

It has been claimed by some physicians that intense nephritis, multiple abscesses, septic pneumonias and sudden cardiac failure, have been directly caused by antitoxin administration, and that this agent, therefore, is to be condemned. No proof has been advanced to warrant such an opinion. Ever since diphtheria has been a subject for discussion, clinical experience has taught us that the most intense complications frequently follow mild clinical manifestations of diphtheria. Perhaps at some future time, we may be able to isolate the various antitoxines, in which event their administration would be possible without the serum medium.

753 MADISON AVENUE, NEW YORK.

THE USE OF ANTITOXIN FOR IMMUNIZATION DURING EPIDEMICS OF DIPHTHERIA IN TWO INSTITUTIONS.

BY L. EMMETT HOLT, M.D.

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From January 18 to April 18, 1895, there occurred in the Nursery and Child's Hospital,* New York, a total of forty-six cases of diphtheria. Thirty of these had pseudo-membrane in the throat; the remainder affected the nose only. In all these the presence of the Klebs-Loeffler bacilli was demonstrated by cultures. These cases had not been confined to one building or ward, but had been scattered throughout the institution. From the first of April, the number of new cases was on the increase, and during the eighteen days preceding the injections, fifteen cases occurred.

On April 18th, one hundred and ten children were injected with the serum obtained from the Board of Health, and eight days later, twenty-six children. In the first group were included all the children in the wards where diphtheria had recently occurred. In the second group were those who had not been so recently exposed. It was impossible to get enough serum on the first date to make all the injections. The injections were given to all the children in the institution except thirty-two who had recently had diphtheria, and a group of about twenty infants under two weeks of age. Of the cases immunized, the following table gives the age, number, and the antitoxin administered :

Age.	Number.	Antitoxin Units.
3 to 4 weeks	7	50
2 months	12	50 to 75
3 to 6 months	36	100
7 months to 1 year	22	150
2 to 4 years	59	200

*I am indebted for this report to my colleague, Dr. A. M. Thomas, during whose service the injections were made.

In children who had been previously well, and in whom temperature observations were valuable, there were four whose temperature rose during the first eight hours to 103° F.; in seventeen there was a temperature of 102° F.; in thirty-two, a temperature of 101° F., and in seventeen a temperature of 100° F. Thus sixty-nine had a temperature reaction. The maximum was reached in most cases in from six to eight hours after the injections, but at the end of twenty-four hours, it had in all instances fallen virtually to normal.

During the night following the injections, there was crying, restlessness, and sleeplessness, all of which symptoms were much more severe in the younger infants and those who were feeble. Many refused food altogether for twelve hours, and cried nearly all the time.

In fifteen of the cases presenting the most marked symptoms, the urine was examined. About half of these showed a faint trace of albumen for one or two days. After this time the urine was normal. There were no general symptoms pointing to disease of the kidneys.

In seven cases, on the eighth or ninth day after the injections, there was noted a more or less profuse erythematous eruption, occurring in blotches about the size of a silver dollar. This was not associated with any rise of temperature, and did not show a disposition to localize in any special area. In one case there was a profuse eruption of fine, red papules on the face on the eighth day, and in another upon the ninth, both being associated with no rise of temperature. The eruption in all cases was transient, in a very few instances lasting over twenty-four hours.

Up to the present date, May 24th,* 1895, a period of thirty-seven days, not a single case of diphtheria has occurred in the children injected. The only diphtheria developing in the institution has been in the person of one of the resident physicians who was not injected.

In connection with this report, I wish to refer to results obtained in the New York Infant Asylum. Dr. G. A. Peck, the resident physician, on April 3rd, made a re-

port in a discussion before the New York Academy of Medicine (*Medical Record*, April 20th,) upon these cases. I will give a brief summary of his report and bring the record down to the present time.

An epidemic of diphtheria began in this institution on September 5th, 1894. There occurred during September, 16 cases; during October, 32 cases; in November, 30 cases; December, 31 cases — this in spite of every effort to check the spread of the disease by quarantine and disinfection. From January 4th to January 14th, 12 cases developed, 9 of these from January 9th to January 14th.

On January 16th and 17th, 224 children were injected with Behring's Antitoxin No. 2, the dose being from 100 to 200 units, according to the age of the children, this being from 1 to 4 years. The following are the dates of appearances of the cases of diphtheria after the first inoculation:

1st case, February 3d, 18 days after injection.
2nd case, February 15th, 30 days after injection.
3rd case, February 22nd, 37 days after injection.
4th case, February 24th, 39 days after injection.
5th and 6th cases, February 25th, 40 days after injection.
7th case, February 27th, 42 days after injection.

On February 27th and 28th, the new cases having appeared with such frequency during the past few days, it was believed that the immunizing effect of the first injections had, in a measure at least, passed away; and 245 children were injected with serum obtained from the New York Board of Health. The dose given was slightly larger than in the previous instance. The following are the dates of the cases following this inoculation:

1st case, March 30th, on the 31st day.
2d case, April 17th on the 49th day after first injection, 13th day after second.
3d case, April 19th, on the 51st day.
4th case, May 3d, on the 65th day.

From May 3d to May 25th, the date of this report, no cases occurred.

*June 21, 1895, the Hospital has remained free from diphtheria up to the present time. L. E. H.

With the outbreak of the case developing on March 30th cultures were made from the throats of all the children occupying the same ward. In four of these the Klebs-Loeffler bacilli were found, and these children were given a second immunizing dose on April 5th. The case developing April 17th was one of these four children. The cases occurring on April 19th and May 3d were from other parts of the institution.

The shortest time after injection at which diphtheria developed, was in the case appearing April 17th, which was on the 13th day; the next, the case of Feb. 3d, on the 18th day. With these two exceptions, no cases developed diphtheria under 30 days, although the children were constantly exposed to infection.

I present these facts without comment. They are, to my mind, conclusive, and I think that no unbiased observer can look over these figures without being convinced that the injection of antitoxin for immunizing purposes is of inestimable value.

15 EAST FIFTY-FOURTH STREET.

THE VALUE OF THE ANTITOXIN IN DIPHTHERIA, AND ITS TOXIC AFTER-EFFECTS.

BY A. SEIBERT, M.D.,

New York.

Since December 1, 1894, I have treated with diphtheria antitoxin twenty-eight cases of bacillary diphtheria (where the Loeffler bacilli were found by the New York Health Department). Two of these were suffering from marked hemorrhagic nephritis before the serum was injected, showing marked improvement within twenty-four hours after injection. Both recovered. Six of the twenty-eight cases presented laryngeal stenosis, requiring incubation in four. Of these, five recovered. Albumen was found in the urine of twenty injected children, before the antitoxin was used. Of the twenty-eight children, two died, both infants. The first, thirteen months old, was injected (20 c.c.m. of serum from the Pasteur institute), while

moribund, entirely against my advice, at the urgent request of the parents and the attending physician. The other, nine months of age, was first intubated for stenosis and then immediately after injected (10 c.c.m. of Behring No. 2), did well for eighteen hours, and then died suddenly of heart failure.

The other twenty-six cases made unusually rapid recoveries, although eight of them suffered from naso-pharyngeal, five from laryngeal and pharyngeal, and four from malignant diphtheria of the entire pharynx. Twelve patients were under two years, and five under one year of age.

A rise of temperature after the injection was noticed in ten of the twenty-six recovered cases. Of these, was one of my own children. In five of the twenty-six recovered patients, severe toxic after-effects appeared in from seven to nine days after the injection of the serum, when all evidences of diphtheria had disappeared, consisting of erythema, high fever (103°–105.4° F.) prevailing four to eight days, infiltration of cervical and inguinal lymph nodes, and articular and muscular inflammations, all disappearing in from five to ten days, but usually leaving considerable weakness in the affected muscles for a week more. In two of these five cases traces of albumen appeared during the attack. In all of these 22 c.c.m. of the serum obtained from the Pasteur Institute in New York during December, 1894, was injected in each case.

I have immunized thirty-six children by the injection of 200 antitoxic units in each (Behring's serum). All remained well.

As I am of the opinion that all theoretical discussion regarding the value of Behring's remedy for diphtheria is of no value whatsoever, I refrain from all further remarks upon this subject.

114 EAST FIFTY-SEVENTH STREET.

DISCUSSION OF ANTITOXIN.

Dr. J. H. Fruitnight reported four cases of diphtheria in which antitoxin was administered. The injections were made in the usual manner by his associate in practice, Dr. George Bieser. The histories were as follows :

Case I—Geo. S., five years, was first seen on February 20, 1895, with indefinite history of illness for three preceding days and the following symptoms: vomiting, prostration, fever, pulse 130, odenopathy, almost intolerable fetor from throat, diphtheritic patches on both tonsils.

On February 21st, the membrane had spread to the naso-pharynx. Bichloride of mercury, muriated tincture of iron, and stimulants were given until five P.M., when ten c.c. of Behring's 600 unit antitoxin was injected into the lower part of the right axilla.

On February 22d, Dr. Geo. Schlereth was called in consultation. The nose discharged fetid pus; the urine was markedly diminished and loaded with albumen; there was stupor, coldness of extremities; the pulse was 130, temperature 101° F.; the fetor from the nose and throat was cadaveric; the mercury, now producing marked systemic effects was stopped, but more energetic stimulation was now resorted to.

On February 23d, there was less pus discharged from the nose; the fetor was almost gone; the circulation was better; the membranes seemed to be thicker and more detachable at the edges; the congestion in the throat seemed to be lessened; the urine was still diminished and albuminous. Peroxide of hydrogen spray in alkaline solution was used and at eleven A.M. ten c.c.m. of Behring's 1,000 units antitoxin was injected into the left thigh. At eight P.M. the spraying was discontinued, because of the boy's resistance.

On February 24th, there was a decided change for the worse; the pulse was almost imperceptible; the extremities were cold; the temperature was 96° F. in rectum; the urine was practically suppressed and heavily loaded with albumen; although the child had coughed up pieces of yellowish membrane, the discharge from the nose had stopped, and there was hardly any membrane in the throat. At eight P.M. of the same day, the temperature had risen to 98° F. and the circulation was better; but no urine had

been passed since morning except a teaspoonful and that was loaded with albumen. He now presented a very peculiar symptom, viz.: he screamed every time he swallowed anything, even a drop of fluid, and held his stomach as if in agony.

On February 25th, the pulse was 98, temperature 98.6° F.; still very little urine (teaspoonful in twelve hours); the fetor was gone; there was no more discharge from the nose; there were only a few patches of membrane left; but the agony of swallowing, in spite of this apparent improvement in the throat, was worse than ever. Rectal feeding was ordered.

On February 26th, this state of affairs continued, and on February 27th he died, with a slow but almost imperceptible pulse while sitting up in bed.

Case II—Annie S., seven years, sister of preceding; when first seen on February 21st, she was prostrated, vomited, had a temperature of 101.5° F., pulse 120. The pharynx and tonsils were red, but no white patches were present.

On February 22d, white patches were visible. Ten c.c. of Behring's 600 units antitoxin was injected. That evening the temperature had fallen to 99.5° F., the pulse was still 120, the child swallowed better.

On February 23d, the pulse was still 120, the white patches were larger, the temperature was 103° F., there was more pain on swallowing.

On February 24th, the child was decidedly better, temperature 99°, the membranes were loosened at the edges, that of the right tonsil looking shriveled up, that upon the left tonsil being nearly gone.

On February 26th, the membrane was gone, having taken five days to disappear. The child ate and slept well, and was discharged cured; but one week later it was learned that Dr. Schlereth was treating her for a severe nephritis which yielded however to treatment.

Case III—Chas. L., ten years, was seen on March 27th. He had been feverish and had vomited the night before. The pulse was 120, there was present a greyish membrane upon the right tonsil of the size of a dime. There was distinct fetor, pain on swallowing, epistaxis, but no adenitis. After twenty-four hours of treatment with iron, bichloride of mercury, and whiskey, the boy was apparently much better; he had no fever but still had a rapid pulse, 120. The parents having heard of the antitoxin wanted it used. Accordingly ten c.c.m. of Behring's 1,000 units antitoxin were injected into the right thigh.

On March 29th, the boy was much better in every way, the membrane looked as if it were a linear strip.

On March 30th, membrane was gone.

Case IV—Annie L., eighteen months, sister of the preceding. On March 29th, she did not complain of being sick, but showed three small patches of membrane limited to the right tonsil. There was no fever, the pulse was 126, ten c.c.m. of Behring's 1,000 units antitoxin were injected. On March 30th, there was a single patch formed by the coolescence of the three spots already mentioned. The pulse was 130, the temperature normal.

On April 1st she was discharged as cured.

In giving the history of these four cases I have no comments to make, but merely give the facts. In the first case, the antitoxin seems to have caused suppression of urine, worse after the second than after the first dose; still even here it had a remarkable effect on the fetor and membrane. The appearance of pain upon deglutition in the first two cases recorded, after the antitoxin had been injected is somewhat peculiar and noteworthy.

In the early periods of an attack of diphtheria, antitoxin is doubtless of some benefit. Its usefulness I think will be limited to cases which may be seen early, and to immunization of those who have been exposed to infection. In the later periods I am inclined to rely upon the older methods of treatment by the exhibition of the bichloride of mercury, calomel fumigations, iron, and stimulants.

Dr. William Osler: Of ten patients admitted to the isolation ward of the Johns Hopkins Hospital, nearly all of which were adults, eight received the antitoxin, the general effects of which seemed to be very satisfactory, particularly in the reduction of the temperature and a more rapid clearing of the throat than one is accustomed to see.

Several of these cases are of a good deal of interest bacteriologically. One, a woman aged fifty-eight, was admitted with general anasarca and the signs of chronic Bright's disease. Five days before admission she had had a severe chill. The tonsils were swollen and reddened, and covered by greyish yellow membrane. The cover

slips and the cultures made during life by Dr. Blumer, my bacteriological assistant, showed at first a pure culture of the streptococcus pyogenes, and we thought that it was probably a streptococcus diphtheritis. Subsequently, however, typical diphtheria colonies developed, and at the autopsy there was a membrane in the larynx, trachea, and bronchi, with Klebs-Loeffler bacilli. There was also present general streptococcus infection. In another case, a boy aged four, there had been earache for three days, and on admission there was a discharge from the right ear. He had not complained of sore throat. He had a coryza, and there was an excoriation about the nose. The Klebs-Loeffler bacilli were present in the discharge from the ear, and also in that from the nose. On the seventh day after admission, he had an excoriation at the base of the left thumb, and the diphtheria bacilli were obtained from it. Though there was never in this case any membrane in the throat, both diphtheria bacilli and streptococci were obtained from it.

In a woman aged thirty-two, who had been in the hospital for some months with progressive muscular atrophy, the throat was reddened and swollen, but presented no membrane. The temperature was 101.7°. Cultures from the throat showed a number of the long variety of the Klebs-Loeffler bacilli. Cultures from the nose were negative. Of course she was not given the antitoxin. In a woman aged twenty-three, the local condition of the throat was really that of a follicular tonsillitis. The exudate seemed to ooze directly from the crypts. On the day following, there was a small area of membrane on the left of uvula. Cultures showed a large number of diphtheria bacilli.

The first case which came under treatment was of interest, inasmuch as the bacilli persisted in the throat for a period of eighty-four days. In a woman aged twenty-two, with reddened and swollen tonsils, but without distinct membrane, the cover slips showed a shorter, plumper bacillus than the Klebs-Loeffler, which corresponded in cultures to the diphtheria bacillus, except that it did not acidify litmus bouillion, but alkalinized it, and grew much

more profusely on ordinary media. Inoculations of a guinea-pig were negative. In two cases the streptococcus pyogenes was present in pure culture. In both, there was membranous exudate on the tonsils. In another instance, a man aged thirty-two, who had had diphtheria when a child, had a sore throat for three days, but when under observation did not present any membrane. The cover slips showed an almost pure culture of the bacillus pyocyaneus.

The point which could be discussed with profit refers to the nomenclature of the cases, in which the Klebs-Loeffler bacillus are not present. What are we to call them? The term pseudo-diphtheria is certainly misleading, as clinically many of these cases are as intense and virulent as the Klebs-Loeffler form. It seems to me we have a choice of either using the term *diphtheroid*, which has been employed by several German authors, or of using the anatomical term, diphtheritis, as Dr. Welch suggests, and specifying a streptococcus diphtheritis or a staphylococcus diphtheritis, depending on the nature of the organism found. At present there is certainly a good deal of confusion, owing to want of harmony between the clinical and bacteriological studies. In any case it is well to emphasize the fact that the streptococcus diphtheritis may be just as virulent as the Klebs-Loeffler diphtheria, and may, as has recently been shown, be followed by the paralyses.

Dr. W. D. Booker: While collecting reports on the use of antitoxin in other cities, I wish to add the testimony from Baltimore. We have not had a great amount of diphtheria in Baltimore this year, though I do not think it has been of much less virulent form than usual. My own experience is limited to thirteen cases in which the Klebs-Loeffler bacillus was found. In six of these cases the larynx was involved and intubation was performed. Two were treated with antitoxin and both recovered. Four were not treated with antitoxin and only one recovered. In the seven cases in which the larynx was not involved, six were treated with antitoxin and one was not. All of these cases recovered. Two of these cases were

complicated with scarlet fever and were seriously sick, as were also two of the remaining cases, while only three could be considered as mild cases. No bad symptom appeared as the result of the antitoxin in any case. In one case there was an annoying urticaria which lasted two days. I have never had such favorable results in the treatment of diphtheria before.

Dr. Henry Koplik: It is unfortunate that we should talk of bacteriological and of clinical diphtheria as separate entities. A healthy throat in a healthy normal child with Loeffler bacilli in it, is no more diphtheria than a healthy mouth in a healthy individual with diplococcus present is pneumonia. There is no distinction between clinical and bacteriological diphtheria. Given a child ill with angina, even if no membrane be seen, having found the Loeffler bacilli in the throat, it is both clinical and bacteriological diphtheria; and given a child ill with membrane in the throat and Loeffler bacilli, it is diphtheria like the first from a bacteriological and clinical standpoint. I wish to insist that calling a healthy throat with Klebs Loeffler bacilli in it, bacteriological diphtheria is wrong. Again it is very desirable in the immunizing experiments in healthy children before we lay any value on the results from a scientific standpoint, that we should first prove that the bacilli present are diphtheria bacilli by animal experimentation. For in these healthy mouths the bacilli are very few as a rule, and it is not possible always to decide exactly (from simple smear preparations) what they are.

Dr. Woodward: I have no statistics from the District of Columbia, but antitoxin has been quite generally used, and I have heard of no case in which it has caused untoward symptoms, and but one in which death resulted, and that was moribund when injected. As to quarantining children whose throats contain the germs, I am satisfied it is unnecessary, provided it is understood that the bacilli in the throat are dangerous to other people. So long as they remain in the throat of the child they do no harm.

They will not fly into the atmosphere to find new throats, and if the child is properly instructed as to the use of other's cups, spoons, etc., they may be allowed to go about without danger. We have, however, a quarantine law that covers the entire time the bacilli are likely to be found there.

Dr. Henry D. Chapin: I hope we shall hear from Dr. Winters on this subject, as he has said he considers the remedy a dangerous one. In connection with the study of antitoxin let us study serum itself and its possibilities of cure aside from its effects in diphtheria. This is not an empyrical remedy, but the result of long scientific study and should be supplemented now by further research.

Dr. Joseph E. Winters: Regarding immunization, I have had no personal experience, but I would state that in the Willard Parker Hospital there is no instance on record of a child having been brought in suspected of diphtheria and proved not to have it, who afterwards contracted the disease while in the hospital, which shows that the activity of the poison is not very great, and it is well known that many people are not at all susceptible to the poison, or are naturally immune.

I would like to ask Dr. Morrill if he has taken into consideration the fact that diphtheria increased almost double between the years 1893 and 1894 in the City of Boston. The variation in the type and in the extent of an epidemic, not only of diphtheria but of all contagious diseases, shows that natural limitations should receive due weight. At one time large numbers of people would be affected during an epidemic, at another but very few. Whether this is owing to a difference in the receptivity of individuals at different periods, or a difference in the activity of the poison is not known; probably both are factors. As showing the futility of immunization by serum, Kassowitz states that of sixty-seven children in the "Bukovina" subjected to injections of serum, thirteen were afterwards attacked with diphtheria, and two of these died. Professor Drasche states that the recurrences observed in some of

the cases of diphtheria treated by serum, prove sufficiently that this serum does not possess immunizing properties. Dr. Le Breton says, inasmuch as the injections are not entirely harmless, and as they may determine lesions of the kidneys and a deterioration of the general condition, we think it would be wrong to have recourse to prophylactic injections, as we felt inclined at first.

I should like to know if during the time that Dr. Morrill's experiments were carried on, would not the results have been the same with the other methods resorted to by him without the use of antitoxin. To my mind these cases prove nothing for antitoxin for immunization purpases.

The advocates of antitoxin treatment for curative purposes base their claims largely on statistics, but they take no recognition of the natural history of diphtheria epidemics. In Boston the mortality in 1875 suddenly rose from 72 a year to 420. Between 1881 and 1894 the mortality varied from 200 some years to over 800 in others. The mortality per thousand inhabitants in 1893 was about one-half what it was in 1884. We are in a dip in the mortality curve at the present time, and this has much to do with the low mortality for which antitoxin gets the credit.

Again, large numbers of very mild cases of diphtheria are brought into the hospitals for antitoxin treatment, whereas, formerly, only the severer cases were brought to the hospital. This also has much to do with the reported statistics of the present day. This is true not only of New York City, but of foreign cities, as stated by Heubner, Drasche, Vierordt, Kassowitz and Kohts, all of whom state that cases of light degree are brought into the hospitals now that were never seen there before. Kohts, of Strasburg states, "in our city the mortality has not been lessened by the antitoxin treatment of diphtheria." He gives the statistics for five years before the introduction of antitoxin treatment and for about five months since the antitoxin treatment, and they are almost identical. Kassowitz, of Vienna, states that during the ten weeks that antitoxin treatment was caried on in private as well as

hospital practice, the mortality was exactly the same as it was before the introduction of the serum treatment.

I feel absolutely confident that at the Willard Parker Hospital the mortality has been much higher under the antitoxin treatment than it was before, if we were to exclude the numerous light cases such as were never seen in the hospital before the use of the serum treatment; but owing to the varying character of epidemics, as has already been stated, mortality is a very uncertain guide, unless it is extended over a period embracing many years.

I would like to ask the members of the Society to take a new view of the antitoxin treatment of diphtheria. It has been the custom to study and report the cases which have recovered. I will ask them in the future to study carefully those cases of diphtheria treated with antitoxin which die. I have seen numerous cases treated from the very beginning of the disease die from straight uncomplicated diphtheria, while the antitoxin did not make the least impression on the disease, where there was never the least evidence that a so-called specific had been administered. So you may take the detailed reports of the fatal cases in the various journals, particularly those in the *British Medical Journal* and in Baginsky's Detailed Reports, and you will find numerous fatal cases there reported, which have been treated from the first and second days of the disease and which have ended fatally, one week, ten days, two weeks, seventeen days after the beginning of the treatment, and where there wasn't the slightest evidence that the course of the disease had been modified in any particular by the use of the antitoxin. It is these fatal cases which were treated from the very outset of the disease, which, in spite of the antitoxin, run a fatal course, which must convince any physician who studies his cases carefully, and who has had much experience with diphtheria, that in antitoxin we have not a remedy which is in any sense of the word a specific. I may further say from what I have personally seen of antitoxin in numerous fatal cases treated from the early part of the disease, that antitoxin does not exert the slightest influence for good in any severe case of

diphtheria. I have seen a large number of cases where, to my mind, the patient was injured by the serum. Some of these have already been detailed in former remarks.

It is pretty generally believed that antitoxin is an absolute specific against the action of the diphtheria toxines in guinea-pigs. The facts are, that of twelve guinea-pigs given antitoxin by Behring, and subsequently injected with toxines, eight died. Of twenty-one injected with antitoxin and toxines at the same timə, twelve died. Of seven injected first with toxines and subsequently with antitoxin, six died and only one survived. It is on these results that Behring bases his claims for the antitoxin treatment of diphtheria.

Dr. Wm. Osler : Dr. Winters has, I think, done Dr. Baginsky an injustice. His most recent paper on the subject put his mortality at only 15 per cent.

Dr. A. Jacobi : I have read the articles referred to by Drs. Winters and Osler, and think I can explain their difference. There were two papers, and, although both came out recently, one had probably been written some time ago and lain in the hands of the printer for a long time. He was the first to report a large number of cases; then followed Roux with his cases. The cases of Baginsky extend over a period of one year, and it struck me as a most important fact that it included two or three months during which he had no serum. During these two months, the mortality rose from seventeen or eighteen per cent. to thirty-eight; in other words, went back to the mortality of former years. That is, to my mind, the most conclusive fact that has been brought out. That the cases seen were very bad, is proved by the fact that since 1890 in about 2,000 cases of diphtheria, there were 553 operations, tracheotomy and intubation. One fact that struck me when I read the paper was that he has intubated and tracheotomized a great deal, and that many of his intubation cases had to be tracheotomized later. Since the use of antitoxin he reports that the number of operations has been very much decreased, and a large number of cases

that would otherwise have developed laryngeal symptoms, did not. He has found, too, that where he intubated there was very seldom necessity for tracheotomy afterwards. He states that while formerly they never believed that intubation could do as well as tracheotomy, since the introduction of antitoxin, the result is quite different. He tracheotomizes less and intubates more. Altogether, the last paper of Baginsky is very much more favorable to the antitoxin treatment than his former one. As to the specificity of antitoxin, it is not necessary that every case of diphtheria should be cured to uphold this point. Quinine is a specific in the treatment of malaria, and mercury is generally accepted as such in syphilis, and yet there are many cases of each disease affected probably, but not cured by these remedies.

Dr. E. M. Buckingham at this point read a paper entitled "Cases Apparently Diphtheria but in which the Diphtheria Bacillus is not Found."

Dr. A. Jacobi : I would add from Dr. Baginsky's book, his statement on the presence of albuminuria and clinical nephritis. The results he arrives at, are, that there are less cases of albuminuria and clinical nephritis in antitoxin cases than in the others ; next, that in diphtheria, nephritis is of common occurrence, and differs from the course of nephritis in scarlatina in that it appears on the third or fourth day ; in scarlatina, not until the second week. To those who are opposed to the use of antitoxin, I would say that Baginsky makes the remark that he does not confine his treatment to antitoxin, but relies on cleansing antiseptic applications as much as formerly. In regard to the nature of diphtheria, I believe, that after having observed it since 1858, I have only lived long enough to learn that I do not know what diphtheria is. Formerly we called diphtheria a disease, in which the fauces, nares, and neighboring mucous membranes were covered by a deposit consisting of changed epithelial cells and fibrin mixed with a few blood cells and leucocytes, and accompanied by more or less fever. Then the

bacillus was found and identified with the diagnosis. There were some at the early day, ten or twelve years ago, who as a number of microbes were found in such membranes, expressed the opinion that diphtheria need not be the product of one microbe alone, but that the same disease might be the result of a number of microbes, the toxines, perhaps, being identical. As time went on, the bacillus was found more and more frequently, and it was stated that diphtheria must be the result of that microbe alone, and cases in which no bacilli were found, were declared to be pseudo-diphtheria, or diphtheroid. From this it has been said, that those cases that look exactly like the bacillus cases but do not contain the bacilli should not be called diphtheria. Now it has always seemed to me, that this was simply an agreement among bacteriologists, and we should not declare it as an axiom. I am satisfied to have it said, I do not know what diphtheria is. I have changed my ways in the last fifteen years and have learned much, but have not yet learned, or am not quite positive that I have to exclude from the diagnosis of diphtheria, those cases that are of streptococcus origin. The worst cases are not those of the simple bacilli alone, but those of mixed form. It is the mixed cases that develop high temperatures.

Dr. F. Gordon Morrill asked if Dr. Winters in referring to the varying character of different epidemics meant to imply, that in one epidemic the disease was more infectious than in another. Last year the hospital was closed three times on account of diphtheria. This year started in with nine cases occurring within four or five days, and the hospital did not have to be closed once.

Dr. A. Seibert: First, let me make a historical correction. Professor Heubner, not Baginsky, made the first report on the treatment of diphtheria patients with antitoxin at the International Medical Congress at Rome, 1894. I do not understand why Dr. Winters attributes suppression of urine in some of his cases to the antitoxin used, and not to the sudden infection of the kidneys by

diphtheritic poison, as we have seen before antitoxin was known. I recorded the two deaths that occurred in my collection of antitoxin cases and cannot recall any paper in German literature, where statistics were modified so as to reduce the mortality figures. I wish to refer to two statements of Dr. Koplik's; that cases of tonsilitis, but without membrane, where the Loeffler bacillus is found in the throat, we must diagnosticate as diphtheria, and when the bacillus is found without pseudo-membrane, we have no more right to diagnosticate diphtheria than to diagnosticate pneumonia, where we find the pneumococcus in the throat with other clinical symptoms. He at times rests his diagnosis upon the membrane and at times upon its absence. It is new to me that the Loeffler bacilli at times cause pseudo-membrane and at times do not.

INANITION FEVER IN THE NEWLY BORN.

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I have used this term to describe a fever usually seen during the first four or five days of life, which is independent, so far as has yet been determined, of any local or general disease, but apparently due to starvation. The term "inanition fever" is not a very satisfactory one, and is certainly open to objections; but it serves to emphasize the connection of this temperature with the fact that the food is insufficient or is entirely wanting.

So far as my knowledge goes, the first to call attention to this was Professor J. W. McLane, of New York, who, in 1890, reported to one of the medical societies an extraordinary case of hyperpyrexia in a newly born infant. The report, I think, was never published. The case in brief was as follows: Prof McLane delivered a woman of a healthy child, and on the following day was called out of town. On his return on the sixth day, he received an urgent summons to come at once, as the baby was alarmingly ill. He found the temperature 106°, and was told

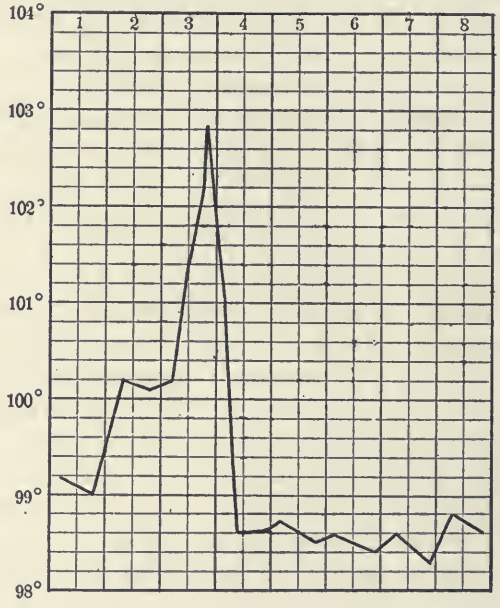
by the trained nurse that it had been in that neighborhood for three days. The child had lost weight so rapidly that he could scarcely believe that it was the same infant. The skin was dry and hot, the pulse weak, and the general impression was that of a child who had but a short time to live. The infant had been put to the mother's breast every two hours regularly, but did not seem to be satisfied. On examination, these breasts were found to be absolutely dry, and it is probable that they had never secreted anything worth mentioning. A wet nurse was at once secured, and without other treatment, the temperature fell in a few hours to normal, and did not rise again. The improvement in the general condition was rapid, and the child was soon perfectly well.

The following case which was recently observed in private practice, is a fairly typical one also of the severe type of the disease. The patient was the second child, the first having died at the age of ten days, apparently from no disease but simple inanition. At birth, the infant, a boy, weighed eight and one-quarter pounds, and was apparently vigorous. During the first forty-eight hours, his loss in weight was five and one-half ounces, and his condition good. I saw him on the evening of the third day. In the past twenty-four hours he had lost eight ounces in weight and the temperature had gradually risen, until at the time of my visit it was 102.8° F.

The child was limp, entirely without resistance to examination. He cried with a feeble whine, and the restlessness of the early part of the day had given place to a complete apathy. The lips and skin were very dry, the fontanelle sunken, pulse weak. As the father—a physician—expressed it, "he had been wilting through the day like a flower in the sun." Although he had been put to the breast regularly, the child had apparently gotten very little. It was found impossible to press any milk from the mother's breasts. Water was given at once freely and a wet-nurse secured in a few hours. The first milk was taken from the wet-nurse at 11 P.M., the temperature (see chart) fell gradually during the night, and the next morning was normal and did not rise again. During the

succeeding four days the child gained eighteen ounces in weight, and at the end of a week was as well as any ordinary infant of his age.

During the past five years very extensive observations upon the temperature of newly born infants extending to upwards of 3,000 cases have been made at the Sloane Maternity, and Nursery and Child's Hospitals. These have established the fact that it is not uncommon for newly born infants during the first five days to have a rise of temperature to 102° or even 104° F., which is ac-



companied by no evidence of local disease, and ceases, in nursing infants, with the establishment of the free secretion of milk. It is also arrested by artificial feeding and very often by water if freely given. The fall in temperature is often quite rapid, frequently dropping to the normal in a few hours, after having lasted for three or four days. In a large number of cases it does not rise again.

The symptoms are so uniform and so characteristic that they make for these cases a class by themselves.

The frequency with which this is seen is shown by the following statistics. Among 200 infants taken successively at the Nursery and Childs' Hospital, twenty had fever during the first five days, reaching 101° F. or over, which was not explained by ordinary causes and followed the course above described. In 500 successive children born at the Sloane Maternity Hospital there were 135 with a similar fever. It was seen in stout, robust infants as well as in those who were delicate. The temperature usually touched the highest point upon the third or fourth day of life. In about two-thirds of the cases the temperature did not rise above 102° F. In nine of the above cases the temperature was 104° F. or over, the highest recorded being 106°. The duration of the fever was usually two or three days. The fall was generally quite abrupt, although not always so. Daily weighings made in these cases showed that the infants continued to lose weight while the fever lasted and that the loss almost invariably exceeded by several ounces that of children who had no fever. The maximum loss noted was twenty-eight ounces. In quite a large number of cases it exceeded twenty ounces; the average loss among healthy infants being ten ounces. As a rule the infants began to gain in weight as soon as the temperature remained at the normal point but not until then.

The symptoms presented by these infants were a hot and dry skin, marked restlessness, dry mouth, and a disposition to suck vigorously anything within reach—everything indicating great thirst. With a very high temperature there was considerable prostration and weakened pulse. In the milder cases there was only unusual restlessness and crying. The rapidity with which the symptoms disappeared when the children were nursed or fed was striking.

It is important that this fever should be recognized, even though the symptoms are not generally severe, as the extra loss of a quarter or half a pound during the first week is a serious handicap to a newly born infant, and one, the effects of which may last for more than a

month. We now make it a rule to take the temperature of every newly born child during the first week. All the usual local causes of fever are first to be excluded by a physical examination. This fever can hardly be confounded with pyogenic infection, for that rarely begins before the fifth or sixth day.

The treatment is simple, viz., to give water regularly every two hours in quantities up to an ounce at a time if required by the thirst of the child. This should be done in every case where the temperature reaches 101° F. In case the temperature does not at once begin to fall, the infant should be put upon another breast, or artificial feeding should be begun. Examination of the breasts from which the child has been nursing will usually reveal the fact that the secretion of milk is very scanty, and often that it is entirely absent.

Such fever from withholding of food and drink I have occasionally seen in older infants, usually in those who are nursing dry breasts, or where fluid food and water have been withheld because of some gastric disturbance. It yields as promptly to treatment as does the same condition in the newly born.

DISCUSSION.

Dr. W. S. Christopher: I have noticed cases of this kind frequently, and am not convinced that the fever is due to inanition. It is frequently due to urinary trouble. I have often seen these children pass masses of urates and uric acid. I have seen a child who has been deprived of all fluids, previous to the commencing of kidney secretion, suffer from fever and great pain. On giving fluid, the pain would cease; there would be a washing out of uric acid masses and cessation of all symptoms. It is not out of place, I think, to consider, in connection with this subject, the old custom of giving teas to babies. It provides the fluid necessary to make the secretion; the heat employed secures the sterilization of the fluid.

Dr. A. Jacobi: I am fully of the opinion just expressed by Dr. Christopher. In the previous remarks the urinary organs were lost sight of. The condition spoken of is frequently found in older children, and may be compared with that found in adults, when no water is taken, and perspiration is going on rapidly. Not only

will the weight fall, but other symptoms, like headache, will set in, with some rise of temperature, which will easily be cured by administering water. In the newly-born, a rapid change is taking place, not only in the circulation, but in general metamorphosis, and the introduction of water will give just such results as Dr. Christopher has described. Thus uric acid infarction may give rise to nephritis. I have seen nephritis in babies of from four to eight weeks old. The formation of stone will easily take place from such infarctions, when there is not sufficient water given.

Dr. J. P. C. Griffith: These cases are exceedingly interesting, and need further explanation. There does not seem to be a good reason for calling it inanition fever; older children are likely to have a low temperature with inanition.

Dr. W. D. Booker: These fevers are probably due more to disordered digestion than to want of nourishment. The stomach of the newborn is unaccustomed to irritation of foreign substances, and even a very small quantity of breast-milk may be sufficient to excite slight inflammatory conditions with indigestion, which in the unstable state of the heat centres at this time, may cause considerable change in the temperature. During the past winter I saw a child who was placed to the breast, at proper intervals, from the first day, but was never satisfied, and cried a great part of the time. Small quantities of sterilized cow's milk and water were given, but it afforded no relief. On the fourth or fifth day the temperature rose to 103° F., and in the night reached 106° F. The navel was clean, and had a healthy appearance, and no source of suppuration could be found. During the next forty-eight hours the mother's breasts were relieved at regular intervals with the breast pump, and the child was fed from the breast of a mother in the neighborhood, who was nursing a three months' old child. During this time the fever entirely disappeared, and the child was again restored to its mother's breast, on which it began to thrive, and soon regained the previous loss of weight. It is difficult to say how much bacteria may be responsible for these troubles, but it is probable that they occur too early in life to be the result of the activity of bacteria.

Dr. L. Emmett Holt: The point I had in mind, was that these cases should be distinguished from septic disturbances of all kinds. I do not like the term "inanition fever" myself, but know of no better one. Dr. Griffith spoke of low temperatures in marasmus in older children,

Those are chronic cases, while these are acute. As to the loss of weight, I think Dr. Rotch must have misunderstood me. All children, of course, lose in the first few days. I wish to call attention to the fact that in these cases the loss is excessive, and that this loss means something. I think we should have the child's temperature kept, as well as the mother's, and give food, or at least water, to every child with a temperature above normal.

RUPTURE OF THE BLADDER.

BY JOHN DORNING, M.D.

New York.

About 5 P.M., on October 17, 1891, C. W., æt. twenty-two months, while playing in the gutter, was thrown down by the wheel of a slowly moving wagon. It was ascertained that the wheel did not pass over him. He was carried home, and within fifteen minutes was seen by two local physicians. It was said that he did not appear much the worse for his mishap, so a simple mixture was prescribed.

The next morning, October 18th, I first saw the child. He was then somewhat restless, and appeared to be slightly distressed. The pulse was 90, small and thready; the temperature 99⅘° F. The abdomen was distended and tympanitic, but not painful on pressure. The right inguinal region was slightly tender on pressure and presented some ecchymoses. This ecchymosis extended down to the perineum beside the scrotum, but did not involve the scrotum. The perineal region was a little swollen. He had passed no urine since the accident, sixteen hours previous. I examined for fracture of the pelvic bones, but detected neither displacement nor crepitus. I inserted a catheter into the bladder, and obtained two ounces of clear urine. An hour later, during an evacuation of the rectum, he voided one ounce of clear urine. I suggested the probable necessity of an exploratory operation. This was not entertained by the parents.

Six hours later a consultation was held. The temperature was 99⅘° F.; the pulse was 90, of good character and

full, due to stimulation; the general condition was about the same. I drew two ounces of clear urine with the catheter. Three quarters of an hour later I gave an enema to relieve tympanitis. With the return of the enema he voided about one ounce of clear urine.

At 10 P.M., the temperature was 100° F.; the pulse 102, small and thready. The child was a little more restless, the tympanitis more marked. I advised operative interference, which was refused.

October 19th, 10:30 A.M.—The temperature was 104⅘° F.; the pulse, 180. The hands and feet were cold, the features pinched. Tympanitis increased. Two ounces of urine were obtained with catheter. At 3 P.M. the child died.

Autopsy—The fundus of the bladder on its posterior aspect presented a tear a half inch long. About four ounces of urine was found in the pelvic cavity. There was but slight evidence of beginning peritonitis. There was a fracture of the ramus of the ischum, without displacement, on the right side. There was also fracture, without displacement, of the angles of the third, fourth, fifth, sixth and seventh ribs.

252 WEST TWENTY-FIFTH STREET.

CEREBRO-SPINAL MENINGITIS IN AN INFANT SIX DAYS OLD.

BY T. M. ROTCH, M.D.,

Boston.

A female infant born February 21st, and weighing eight and three-quarter pounds, was apparently healthy and remained so until it was six days old. It then refused to nurse, and what little it took was vomited. It cried out when asleep, and at times would awake with a sudden start. The temperature in the afternoon was 104.2° F., and she cried almost all night. The next morning, February 28th, the temperature was 101.6° F. At 5:10 A.M. she had a convulsion and another at 6 A.M. She was then quiet, and nothing abnormal was detected until 10 A.M., when she had a number of convulsions. These convulsions continued all night. On the following day the con-

vulsions continued. The temperature remained between 101° and 102° F. In the afternoon on careful physical examination nothing abnormal was detected; between the convulsions she seemed perfectly well. The convulsions were clonic and general. She remained in this condition until 1 P.M., when she was noticed to be somewhat cyanotic, but later, at 4 P.M., the color was good, and she seemed well and comfortable. The convulsions, however, returned at 4:15 P.M., lasted about two minutes, and at 4:25 she had another convulsion and died.

Summary—An infant born healthy and remaining perfectly healthy for six days, began to have convulsions on the seventh day, and, after having fifty convulsions, died on the eighth day of her life.

The post-mortem examination was made by Dr. W. F. Whitney eighteen hours after death. The report was as follows: Rigor mortis well marked. Lividity of the dependent parts of the body in small separated patches over the legs, arms, and chest.

Head—Calvaria presented nothing abnormal. The inner surface of the dura mater was covered with opaque yellowish patches, the lymph especially marked over the base of the skull. The vessels of the pia mater were markedly injected and the meshes of the pia mater were filled with an opaque greenish-yellow purulent exudation. This extended over the entire brain and into the spinal canal. Microscopic examination showed the presence of large micrococci usually associated in pairs, two of which were sometimes united with a chain of four (pneumococcus).

Heart—The heart was normal and its cavities were filled with dark fluid.

Lungs—The lungs were not fully retracted, and were engorged with dark blood which was so abundant as to suggest extravasation into the alveoli. The pleura surfaces were perfectly smooth.

Abdominal Organs—The spleen, liver, and kidneys were markedly injected with blood, but were otherwise normal. The stomach and intestines presented nothing abnormal.

Pathological Diagnosis—Acute cerebro-spinal meningitis. General venous congestion.

It is well known that in young infants the symptoms of cerebro-spinal meningitis may be merely a heightened temperature with clonic convulsions, and that the diagnosis cannot be made during life from the various forms of reflex convulsions which may occur at this age, and cerebro-spinal meningitis can only be suspected.

In this infant the onset of the attack followed a period of extreme nervous excitement in the mother, who was nursing it, and when I saw it in consultation with Dr. W. L. Richardson, it seemed possible that the convulsions were of a reflex form such as might follow from disturbance in the breast-milk. The absence of retraction of the head, opisthotonos, any abnormal symptoms connected with the eyes, and the perfect tranquility and apparently healthy condition of the infant in the intervals of the convulsions, made the supposition of the convulsions being reflex still more probable. Cases of this kind should be put on record in order to warn us that a most guarded prognosis should be given in all cases of infantile convulsions.

197 COMMONWEALTH AVENUE.

PYOPNEUMOTHORAX.

BY WALTER LESTER CARR, M.D.,

New York.

James Cosgrove, aged ten months, was brought to the Out-patient Department, St. Mary's Free Hospital for Children, on November 17th, 1894. The baby's mother said that he had fever and a hacking cough for about two weeks. He had been restless, and had moaned as if in pain. There had been a loss in weight, but the baby nursed as usual, except that he took the breast more often and would nurse only a short time.

Examination—*Inspection*—Respiration is oppressive and rapid, 80 times a minute. The right chest appears rather fuller than the left, though there is no bulging of

the intercostal spaces, and there is no actual difference by measurement. The movements of respiration are almost entirely abdominal. The left chest moves more freely than the right. There is a tumor in the fifth intercostal space of the right side that extends from the axillary line to the angle of the scapula. The skin over the prominence is normal. The veins of the back are distended.

The visible area of the cardiac apex is not displaced.

Facial expression indicates pain. There is great activity of the alæ nasi. The mucous membranes are a good color, and the extremities are not cold.

Palpation—Nothing of importance is to be elicited by palpation, except that the heart's apex is not to the left of its normal position.

Percussion—Anteriorly on the right side the note is tympanitic to the lower border of the eighth rib. Hepatic dulness extends three inches below the free border of the ribs on the mammillary line. In the axilla and back to the scapula there is slight dullness on light percussion from the sixth to the eighth rib. Close to the spine percussion is not so resonant. Over the tumor the note is tympanitic. The left lung is extra resonant.

Auscultation—There is absence of normal respiratory sounds on the right side. Amphoric breathing is to be heard anteriorly and as far back as the middle of the scapula. Posteriorly there is indistinct bronchial breathing between the scapula and the spine. Friction sounds are heard over the base of the right lung. Pressure on the tumor increases their number and produces creaking and the large crackles of emphysema. The same condition supervenes with an attack of cough. It is impossible to produce succession and metallic tinkling. There is exaggerated respiration over the left lung.

The pulmonic second sound is intensified.

Temperature 101° F., in the rectum; pulse, 160; respiration, 80.

The mother was not willing to allow of any operative procedure, and as the baby was only ten months old, and under every disadvantage of bad hygiene and little care,

it was not advised. Firm pressure was made over the emphysematous tumor by a gauze compress and rubber plaster. After the dressing the baby was more comfortable and breathed less laboriously.

November 18th—Morning temperature, 100° F., in rectum; pulse, 148; respiration, 50. Evening temperature 100.4° F.; pulse, 142; respiration, 50. The Sister from the hospital records, that though the baby is weak, he nurses and sleeps well. The cough is loose and there is a free expectoration of an offensive muco-pus, streaked with blood. The purulent discharge is increased by pressure against the chest wall.

November 20th—Temperature last night was 100.4° F., to-day it is 100° F.; pulse, 144; respiration, 52. There is tympanitic resonance on percussion. The movement of right chest is a little better than on first examination. Respiratory sounds are the same as those first noted. Coarse friction sounds are to be heard in the axilla at the base of the right lung, with crepitation over the swelling. Cough is not difficult.

November 22d—Sputa muco-purulent, streaked with blood. Chest movement is easier. Mucous membranes are pale, and anterior fontanelle is depressed.

November 24th — Resonance is vesiculo-tympanitic. Friction sounds are to be heard over the site of the tumor, which is barely perceptible. There is no purulent or bloody expectoration. Baby sleeps well and is improving.

November 27th—There is no evidence of the tumor. Respiratory action is good. The right chest is not extra resonant. There is a dull note at the base of the lung from the axillary line to the angle of the scapula, which is gradually lost within two inches of the lower border. Respiratory murmur is weak. Friction sounds at the base of the lung.

December 6th—Respiratory murmur on the right side is still feeble. General condition is improved.

The sputa were examined by Dr. R. G. Freeman, and found to contain streptococci. No tubercle bacilli were present. There were no fibres or shreds of lung tissue.

It is probable that the baby had an empyema, which

had ruptured and discharged itself through the lung. Antedating the pleurisy there may have been a pneumonia.

Owing to the positive refusal of the mother to allow of any operative interference, the management of the case was limited to bandaging the chest and supportive treatment. The baby was given peptonoids, with creosote, and small doses of codeia when unable to rest. Whiskey was administered as required.

In March, 1895, the baby was in good health, and except for friction sounds at the base of the right lung, there was no evidence of disease.

The case is of interest, first, because of the rarity of the disease in infancy, and, second, because succussion and metallic tinkling, which are given in the text books as physical signs of pathognomonic importance, could not be elicited.

There is but little mention made of this subject in the recent works on diseases of children. Koplik, in Starr's text-book, gives a line to it, and states that succussion is important.

Brothers, [ARCHIVES OF PEDIATRICS, March, 1895) could not get tinkling râles or succussion in his patient. There can be no doubt that the two signs of succussion and metallic tinkling may be wanting where the effusion is small and purulent, or where there is plastic exudation.

6 EAST FIFTY-EIGHTH STREET.

LYMPHO-SARCOMA OF THE SPLEEN.—(CASE AND SPECIMEN.)

BY GEORGE N. ACKER, M.D.

Washington, D. C.

Charles Hill, colored, æt. eight years, was admitted to the Children's Hospital, September 13, 1894. Mother and father were living and in good health; no other children. The boy never had any of the diseases of childhood. About January, 1894, a large swelling was first noticed on his left side. He also complained of pains in the side, and labored breathing was apparent at times. He never had malarial disease, and the mother could not throw any light on the origin of the growth.

Present Condition—There is a large movable tumor situated in the left lumbar region, extending to half an inch to the right of the umbilicus, and as far down as Poupart's ligament. The lateral measurement is nine inches. The tumor is nodular and very hard and not painful on pressure. It can be moved in any direction. The child is poorly nourished and anæmic. The skin is in good condition—conjunctivæ yellow. The posterior cervical glands are the only glands enlarged. The lungs are normal. The area of cardiac impulse is increased. There is anæmic murmur over the base of the heart. The urine is normal; the appetite enormous.

A teaspoonful of the elixir of the phosphate of iron, quinine, and strychnine was prescribed, to be taken three times a day, together with five drops of liquor potassii arsenitis. Compound iodine ointment was applied over the tumor.

September 24th.—No pains since admission. Bowels moved about twice daily. The red blood corpuscles were uniform in size and did not form rouleaux. These apparently diminished in number. The leucocytes increased in number.

September 27th.—The bowels were loose. The Fowler's solution was omitted and two grains of bismuth, subgallate with three grains of aromatic powder were given every three hours.

October 3d.—The bowels were regular and urine normal. The powders were stopped and treatment was resumed.

October 20th.—Tumor appeared to be reduced in size. General health good.

December 2d.—The child was suddenly taken with nausea, vomiting, sore throat, and high temperature (103.5° F.) The pharynx presented a bright red color. There was pain in the throat; the cervical glands were enlarged. Scarlet fever diagnosticated, and boy removed to isolating ward.

December 3d.—Patient very restless; slight redness of the palms of the hands and on the inner side of the thighs; throat red and swollen; temperature 104.6°. Throat was sprayed with Dobell's solution every two hours; a bitartrate of potash mixture was ordered, and four ounces of milk every three hours. At four P.M. the child was weak and restless. Temperature 104.6°. At nine P.M. he vomited a large amount of mucus and bile.

December 4th.—One A.M. temperature 105.4°. Very restless and unable to retain any nourishment. Four A.M. vomiting continued; temperature 106.4°; very restless and uneasy; pulse very weak and thready. Several tub-baths were given during the night but did not have any effect on the temperature. At eight A.M. the child passed quietly away.

Post-mortem Report.—Rigor mortis marked; some adipose tissue present; increased pericardial fluid. The heart weighed six ounces; there was acute swelling in places on edges of the mitral valve. The lungs were normal; the kidneys firm. The right kidney weighed six ounces, the left seven ounces. The *intestines* and *pancreas* normal. The *liver* weighed forty-eight ounces. It was congested and was bound to the diaphragm and peritoneum by strong adhessions. The *spleen* weighed fifty ounces (fifty-two when fresh). It was firm and congested. The splenic glands were enlarged and reddened. The spleen occupied the left hand of the abdominal cavity and was bound down to the peritoneum and the mesentery by fibrous bands.

MICROSCOPICAL REPORT.

BY WALTER REED, M.D.

Curator of the U. S. Army Medical Museum and Library, Washington, D. C.

Microscopical examination of the spleen shows a marked congestion of the organ, together with hyperplasia of the splenic trabeculæ; the malpighian bodies are smaller

than usual. This passive congestion of the organ is probably due to the pressure of the enlarged chain of splenic glands upon the splenic vein. Sections of the enlarged glands which were found in the hilus of the spleen show numerous collections of lymphoid cells scattered throughout the entire area of the gland, together with many epithelioid-like cells which occupied the intervals between the lymphoid nodes. Sections of the liver show many small collections of lymphoid cells scattered throughout the liver parenchyma, and a few larger lymphoid nodes adjacent to the portal vessels; in many of these foci of lymphoid cells, there are to be seen one or several necrotic liver cells, some of which still partially preserve their nuclei. Sections of the kidney were normal.

Since no other glands of the body were involved in this case it would appear that it is a case of lympho-adenoma, or lympho-sarcoma, originating primarily in the splenic glands.

913 SIXTEENTH STREET.

SARCOMA OF THE LEFT SUPRA-RENAL CAPSULE AND METASTATIC SARCOMA OF THE SPINE IN AN INFANT FIVE WEEKS OLD.

BY AUGUSTUS CAILLÉ, M.D.,

New York.

This specimen was taken from the body of an infant brought moribund to the Babes Ward of the Post-Graduate Hospital, N. Y. It showed convulsive twitchings and contractures of the extremities and a marked stiffness of the neck, so that some form of central lesion was at once diagnosed, particularly as the urine was found to be normal. The lungs and heart were free from disease. The autopsy showed a new growth of the supra-renal capsule. Diffuse metastatic sarcoma was located at about the third cervical vertebræ. An examination proved the tumor to be a cysto-sarcoma in the centre of which a large blood clot was visible. Had palpation of the tumor been possible

through the extremely tympanitic and tense abdomen it would probably have been regarded as a large spleen.

DISCUSSION.

Dr. L. Emmett Holt: This looks very much like a primary hemorrhage into the supra-renal capsule. As most of you know, that condition is not so excessively rare in the newborn. It might have been primary rather than secondary.

Dr. Caillé: That was our first impression, but our pathologist found it to be a round-celled sarcoma.

SOME FORMS OF ERUPTION SIMULATING SCARLATINA.

BY A. D. BLACKADER, M.D.,

Montreal.

In presenting the notes of the following cases to this society I feel that an apology is in order. There is nothing new in what I have to say, and probably were I to search the columns of our medical journals for a few years back, I might find cases similar to to the ones I now present to you.

My chief object in writing, when I proposed the paper, was to emphasize the fact, recognized, I admit, in some text books, but very much overlooked by the general practitioner, that the mere presence of a scarlatinal rash, going on to desquamation and associated with pyrexia, does not of itself warrant the diagnosis of scarlet fever ; not even although it should present a certain amount of superficial tonsilitis. Cases will occasionally arise in which with our present knowledge an absolute diagnosis is impossible until some days have elapsed. In such the public should be educated up to the necessity for caution, and to the recognition of the difficulties that may occasionally lie in the way of a prompt decision, and at the same time the physician should be extremely cautious for the first few days lest he too rashly condemn a child to a six or eight weeks' quarantine, and a family to all

the suspense and worry connected with such a proceeding, when caution, time, and frequent careful observations on the course, and exact symptoms of the attack, might make it evident that prolonged isolation was unnecessary. Moreover, every hospital, especially every infectious hospital, should have numerous isolation rooms where doubtful cases can be detained for a time until the diagnosis becomes absolute. On receiving the programme for the meeting, however, I found I was put down for a paper on *forms of eruption simulating scarlatina.* I have, therefore, slightly altered the arrangement of my notes to make them correspond more exactly to the subject allotted me.

Among the simplest of the scarlatiniform rashes, and among the least liable to give rise to serious difficulty in diagnosis, are the scarlatiniform erythemata, which occasionally result from the administration of certain drugs.

That an erythema closely resembling scarlatina may be produced by belladona is acknowledged by all, but it is perhaps not so often seen as we might expect, considering the heroic doses in which the drug is occasionally given to children. A case in which this erythema was particularly well marked, occurred recently in Montreal, for the notes of which I am indebted to my friend, Dr. A. S. Wade.

On the seventh of this month he was called to see a child five years old who had eaten surreptitiously fifteen sugar-coated granules of atropine, each containing one-one hundred and twentieth of a grain, in all one-eighth of a grain of atropine. On arrival he found the child in convulsions with skin dry and hot, and completely covered, literally from crown to sole, with a diffuse bright scarlatiniform rash, punctate in character, disappearing momentarily on pressure, and leaving a distinct white line after the finger nail drawn rapidly over it. The pulse was 160, weak and compressible. Before the convulsion the child had been delirious, and the pupils widely dilated. Under careful and prompt treatment, the symptoms abated, and on the doctor's visit on the following morning, the rash had faded, and the child was running round.

Salicylic acid and its compounds are more frequently credited with producing an urticarial rash than a scarlatiniform erythema. The following are the brief notes of a case in which a rash distinctly scarlatiniform in character was apparently due to this drug.

John H., aged seventeen, an anæmic lad, entered Montreal General Hospital, April 29th, suffering from ill-defined rheumatic pains, and very slight pyrexia. Under a few days rest in bed these passed away, and he was placed upon a preparation of iron. Following a sudden change in temperature a recurrence of the rheumatism took place, for which sodium salicylate, in fifteen grain doses, was ordered. On the third day he complained of a feeling of fulness in the head, while on the neck and shoulders, upper part of chest, and the flexor surfaces of the arms appeared a diffuse erythematous rash. By the following day the character of this rash was more pronounced. It covered all the trunk, extending as low as the inner surface of the thighs with a distinctly scarlatiniform erythema. On the forearms and lower part of the thighs it presented the appearance of scattered, slightly elevated, round or oval, spots, most of them of rosy color, but some of them with paler center, more urticarial in appearance, and in places tending to coalesce. There was no pyrexia, the tongue was clean, and the throat normal. The salicylate was now stopped, and *post* or *propter*, the rash faded, so that by the following day it had almost disappeared. No desquamation was noticed.

The rashes of phenacetin and phenazone are generally too patchy in character to give rise to any suspicion of scarlatina. The following case, however, which I attribute entirely to the action of the drug, gave rise for some hours to fear lest it might prove to be scarlatina.

Laura T., aged four years, of neurotic temperament, and with a skin sensitive to slight irritation, was taken ill in the afternoon of April 11, 1893, with vomiting, severe headache, and pain referred to the right side. The child had been out for a long drive the previous afternoon, with a sharp northeast wind blowing. I saw it about three P.M. and found a temperature of 101.5° F., pulse 120, respiration 26, and tongue slightly furred. The bowels previously had been quite regular, so a simple saline was prescribed. In the evening I found the child very rest-

less, complaining of headache and pain in the side, but of both rather indefinitely. Careful examination revealed little beyond feeble breath sounds; the temperature was 102.8° F.; the pulse-respiration ratio was not much disturbed. I prescribed a four grain phenacetin powder. Early next morning I received an urgent message that the child was covered with a rash, and that the mother feared scarlet fever. I found the child easier, but the neck and upper part of trunk was covered with a distinct red rash resembling scarlatina. At the lower edge of the rash and on the lower limbs small round oval, erythematous spots appeared with definite and slightly raised margins. The tonsils were reddened, but not the soft palate. The temperature was 102° F., the pulse 108. By the afternoon the rash had begun to fade. A painful cough developed, and by the following morning indications of a distinct effusion were present on the right side. It ran a very rapid course, and I had to perform paracentesis on the sixth day owing to rather alarming pressure symptoms. I may add that in this child quinine, on two separate occasions, given in small doses, produced an urticarial rash.

Copaiba may also in my experience give rise to a rash which may in some degree resemble scarlatina.

Many other drugs are reported as having produced a scarlatiniform erythema. Among the more important, are oil of turpentine, iodoform, arsenic, chloral hydrate, mercury, santonin, ipecacuanha, sulphur, strychnine, and iodine. I have not myself seen a case resulting from any of these.

In an allied group to the rashes produced by drugs, we may place those transitory scarlatiniform erythemata due probably to the accidental absorption of some toxin from the alimentary canal, or elsewhere.

Amongst these, I should place the erythema which has been occasionally observed to follow the use of enemata. Several cases are recorded in which, within a few hours after the administration of a simple soap and water injection, a distinct scarlatiniform rash has made its appearance, at first about the neck and shoulders, and has then spread from above downwards over a large surface of the body; this rash persists for a variable period, is never accompanied by pyrexia, but is generally followed by desqua-

mation. Transitory erythematous blushes, or distinct rashes, are also occasionally noted in connection with cases of tonsillitis and diphtheria, and in septicæmic conditions in children.

The following is a very marked case, possibly due to a somewhat similar cause, which occurred in the family of my *confrère*, Dr. Gordon Campbell, of Montreal.

W. C., female, aged twenty-one, was suffering from pleurisy on the left side, with effusion. On April 9th, the eleventh day of the illness, the amount of the effusion was at its maximum, reaching as high as the third rib anteriorly. There were no symptoms of interference with the circulation or respiration. That evening the patient complained that an eruption was coming out on her face and neck. On examination by gas light, nothing was evident beyond a little roughening of the skin and flushing of the face.

On the following morning, a rash extremely like that of scarlet fever, if not identical with it, was present all over the body, but more intense on the back and upper parts of the trunk. It was of a bright scarlet red color, and on close examination showed a punctate appearance on a uniformly red ground. The skin was not roughened, and on drawing the finger nail across it, a white streak was left for an instant. The throat was not injected, nor did it feel at all sore or dry to the patient. The temperature, which had been 100.6° F. for the previous two days, remained the same. There were absolutely no symptoms referable to the rash except slight itching, which came on in the evening and was more pronounced the following day. The eruption persisted for five or six days, was quite as intense the second day as the first, and then gradually faded, remaining longest on the back. Desquamation, consisting of fine branny scales, was noticed as occurring on the face and legs, and persisted for seven weeks. This patient had scarlet fever in infancy, and my friend was so positive of his ability to exclude definitely any form of infectious fever that he allowed his own child, ten months old, to frequently enter and remain in the room with the patient. No treatment was employed. The patient was taking at the time triturates of strychnia gr. 1-50 three times a day, and was allowed to continue with them. There was nothing in the food taken which could possibly appear as the cause of the rash. Both diet and treatment had remained unchanged for the week previous to its ap-

pearance. Notwithstanding the rash, the patient made a rapid uninterrupted recovery from the pleurisy.

Much more liable to give rise to error are occasional cases of erythema roseola, which, although generally resembling rubeola, does occasionally in children assume over the greater part of the body a distinctly scarlatiniform appearance. These cases, associated as they may be with a slight elevation of temperature and quickened pulse, may give rise to some anxiety. The rash, however, is very transitory, and I do not remember having ever seen a case where it was uniformly scarlatinal over the whole body; generally on the limbs or back, the rash assumes a distinctly morbilliform character. The throat in these cases is quite free from any inflammatory appearance.

Acute desquamative dermatitis is another condition under which we may have a well marked scarlatiniform rash, going on to desquamation, and associated with more or less pyrexia. The following is an interesting example, for the notes of which I am indebted to Dr. Shepherd, of Montreal.

Thomas Smith, aged sixteen, office boy, born in England, presented himself on the 9th of July, 1893, at the out-patient department for diseases of the skin, of the Montreal General Hospital. The following is an abstract of the notes taken at the time:

The lad is anæmic, and has never been strong. Three months ago, a scarlatiniform eruption appeared all over the body. It was associated with fever and vomiting. The fever lasted about nine days, when desquamation set in, continued for ten days, and then the boy got perfectly well. Two weeks previous to the present appearance, he had a similar attack, followed by a similar peeling of the skin to that which is now going on. This desquamation resembles very closely that of scarlet fever. There is no redness or inflammatory condition, but the skin is covered with fine white branny scales, and is very itchy. On the palms of the hands and soles of the feet, there are large blisters, in size varying from that of a five cent piece to that of a silver dollar. These fill with watery serum, and when this is let out, the piece of skin covering it becomes detached. No scab forms as in ordinary pemphigus. Numerous marks of previous blisters are visible. Over

some of these spots the skin is in a cracked eczematous condition. There is also well marked eczema of the sides of the fingers. Under a course of arsenic the condition completely passed away and desquamation ceased. The following year, on the 24th of March, the lad returned. Eight days previously he had had a distinct chill; on the two succeeding days he was "out of sorts;" and on the third day he felt sick at the stomach, and afterwards a red, uniform rash appeared and gradually spread until it covered the whole body. He felt hot and feverish. The rash remained out for three days, and began to fade the day previous to his presenting himself at the hospital. On examination the only evidences of the rash at the time were found about the thighs, which were covered with a uniform scarlatinal erythema. Both ears were covered with fine desquamating scales. The tongue was clean, but the papillæ were enlarged. The throat was not reddened and was said not to be sore. His principal complaint was of the itchiness of the skin. The temperature in the axilla was 100° F. A saline mixture was prescribed. The patient returned again in June of the same year with a very similar condition of the skin, and was placed on a course of arsenic, under which recovery took place.

The most important of these scarlatiniform rashes, because most frequently met with, and most liable to be mistaken, are those cases of rubella or rotheln which present a scarlatinal rash. In general, the exanthem of rubella more closely resembles measles than scarlet fever; but every now and then, more frequently in some epidemics than in others, cases arise when it is impossible to give an immediate absolute diagnosis. The rash on the first appearance may show no characteristic difference; pyrexia may be present and a varying amount of tonsillar congestion. In such cases the all important factor for correct diagnosis is time, and the following consideration will influence us :

Even in mild cases of scarlatina we find a more decided disturbance of the nervous system, than in cases with a similar amount of pyrexia in rubella. Drowsiness or marked irritability of the nervous centers generally precedes the appearance of the exanthem in the former disease, almost never in the latter. In rubella the rash, especially after the second day, and on the lower extrem-

ities shows a distinctly patchy condition, with well defined and slightly raised margins, or sometimes assumes an almost morbilliform appearance, which is never the case in scarlatina. In scarlatina the pharyngeal congestion is always more or less present, and always bears a fairly definite relation to the amount of rash. In rubella the exanthem may be well marked while the congestion of throat may be slight, and limited to the tonsils. The post cervical glands are almost always enlarged early in an attack of rubella; if enlarged at all in scarlatina, it is only towards the close of the first week. In scarlet fever, even in mild cases, towards the end of the first week, we have a distinct loss of epithelium on the dorsum of the tongue, giving rise to the well known term "strawberry tongue." This, of course, is much more manifest in some cases than in others, but I believe always takes place. I have never noticed it in rubella. I cannot, for myself, place the same value on a quick pulse that some writers do. Like other symptoms it may occasionally deceive us. I have seen cases of undoubted scarlatina, where the pulse, though quickened, was only moderately so. The incubation period can only be of value to us where several cases occur successively in the same family.

In all such cases we should insist on absolute isolation, but claim time before we express our diagnosis, and as teachers, while emphasizing to students the danger incurred in overlooking mild cases of scarlatina, we should also point out not only the unnecessary expense and wrong to parents involved in stamping every case of scarlatinal rash, as the much dreaded scarlet fever, but also the actual danger to the child affected should it be sent to an infectious hospital. The following is a case in point, the particulars of which were related to me by a friend.

C. H., a lad of about seven years, when seen was covered with a well marked scarlatiniform exanthem covering the greater part of the body, which had appeared the day previously. The child did not look ill, and complained of nothing. His temperature was 100.5°, the pulse 95, and the tongue somewhat furred. There was no history

of any prodromata. The case was declared to be one of scarlet fever, and the child sent to an infectious hospital. On the following day the temperature was almost normal, but on the next it rose suddenly to 106° F. and the child died in a comatose state the following morning. Two other children in the same family took ill, ten days after the first had been removed to the hospital. There was the same scarlatinal rash, slight pyrexia rapidly subsiding to normal, desquamation on the second week and rapid recovery.

236 MOUNTAIN STREET.

TWO CASES OF SCARLATINIFORM ERYTHEMA.

BY CHARLES GODWIN JENNINGS, M.D.,

Detroit.

To illustrate one of the diseases, not always easily differentiated from scarlatina, I report the following two cases :

CASE I.—This case was diagnosticated surgical scarlatina by the attending surgeon, and was reported as such in *The Physician and Surgeon*, April, 1895.

The case, to my mind, will not stand close analysis. I gave in consultation a dissenting opinion, and would classify it as scarlatiniform erythema. At least the diagnosis is open to question. I quote in abstract the clinical history of the case from the reporter's paper :

The patient was a boy, aged fifteen years, who had had scarlet fever when eight years of age. On February 15th he was taken with appendicitis, and came under the care of another physician. He was seen by the surgeon February 18th, and the next morning a laparotomy disclosed a gangrenous appendix and a foul abscess.

The patient did well after the operation; the fever subsided, and in two days the temperature showed normal in the morning, with a slight evening rise. As is usual in such wounds, there was for the first three days a very foul discharge, and the connective tissue exposed to its contact developed superficial sloughs. The discharge then ceased to be offensive, a good granulating surface developed, and the sloughs rapidly separated.

The boy was doing well in every way, and recovery seemed certain. On the evening of February 24th, nine

days after taking to bed and five days after the operation, he had a chill, followed by a temperature of 100.5° F., and a pulse of about 100. [The chart of this case was unfortunately destroyed by the nurse, and it is impossible to give a verifiable record of pulse and temperature.] Castor oil was given at bed-time. On the morning of the 25th, the patient was depressed and nauseated, but did not vomit—temperature, 102° F.; pulse, 100. His throat was sore and his body broken out with a scarlet rash. In the evening the rash was more pronounced; the temperature was about the same as in the morning. By the morning of the 26th the eruption had spread over the whole body. His throat was covered with a red rash, and his tonsils were slightly swollen. His tongue, which on the first day had been coated white, with red edges, had now cleaned and showed the regular strawberry appearance of scarlet fever. The fever still continued, and, though not high, persisted, with the exception of a few hours, until his death, the temperature ranging thence forward from 99 to 100 degrees, and his pulse from 80 to 96.

The possibility of rubella was excluded, while the perfectly quiescent condition of the wound and abdomen put septic infection out of the question. The diagnosis of scarlatina was made accordingly, and the house placarded.

On the morning of the 27th, abdominal pain and vomiting ushered in what proved to be an intestinal obstruction that terminated fatally at 6 o'clock A.M., March 1st. The history of the complication had no bearing on the exanthem and will be omitted.

Post-mortem examination revealed a clean granulating wound, an aseptic abdominal cavity, an obstruction due to entanglement of the bowel in the cicatrizing wound, and engorged, dripping kidneys.

I saw the patient at 4 o'clock in the afternoon of the 27th, the day of the onset of the symptoms of obstruction, and seventy-two hours after the initial chill of the exanthem. At that time, the only remaining vistage of the exanthem was a small area of punctate erythema in each groin. The tongue was pale, showed no enlarged papillæ, and the mucous membrane of the mouth and throat were normal in appearance. From the condition of the child as I saw him, and from a careful study of the clinical history from the beginning of the disease, I expressed the opinion that the child had not had scarlatina. My

reasons from dissenting from the diagnosis of the physicians in attendance were:

(1) The previous attack of scarlatina.

(2) The absence of exposure to contagion. A period of incubation as long as nine days is so unusual, that it is safe to assume that if an isolated patient develop scarlatina as late as this, the disease has been brought to him by his attendants or other persons coming in contact with him. No such possible exposure could be traced in this case.

(3) The extreme divergence of the clinical phenomena from that of even a mild scarlatina.

On the day of the development of the rash, the second day of the disease, in addition to the sharp febrile temperature and eruption, the diagnosis of scarlatina will depend upon four associated phenomena, viz.:

(*a*) The vomiting.

(*b*) The peculiar tongue, coated white, with prominent red papillæ.

(*c*) The injected, sore, and often pseudo-membranous throat.

(*d*) The peculiar rapid pulse.

The vomiting is the least constant of these symptoms, occurring in about eighty per cent. of the cases. The peculiar tongue can be depended upon in all but the mildest cases. It is rare that the accurate observer will be in doubt. My own experience leads me to place much reliance upon this symptom. The injected throat is always present. The rapid pulse, rapid out of proportion to the temperature, and other phenomena, I have learned to look upon as a pathognomonic of scarlatina. A pulse of 140 to 160 is usual. According to my observation, a pulse below 120 in a child is of extreme rarity, even in the mildest cases, and a pulse of 100 or below would, in the absence of known exposure and an otherwise typical course, exclude scarlatina.

In the case under consideration, the temperature, 102° F. on the second day, and the well developed rash, marks a well defined case of scarlatina, and unless the state of surgical convalescence modified the course of

the disease in a remarkable manner, the other clinical phenomena should be as well defined. Instead of that, the history is most erratic. On the morning of the second day there was nausea, but no vomiting. The castor oil of the night before might have caused this. There was a slight sore throat, but that was gone in twenty-four hours. The report states that the tongue presented the characteristic appearance of scarlatina—coated white, with red edges on the first day, cleaning off and presenting the strawberry appearance on the second. Here, however, comes a question of accuracy of observation. The tongue of scarlatina does not go through these changes with that rapidity. Not before the third or fourth day is the white coating off, and the red strawberry tongue presents most characteristically on the fourth or fifth day of the disease.

When the case came under my observation at the end of the third day, the tongue, mouth, and throat were perfectly healthy. The maximum pulse-rate had been 100, and that only on the second day, when the temperature held at 102° F. Whatever influence the surgical state might have upon the rash, and the other phenomena of an intercurrent scarlatina, it is difficult to conceive such an effect upon the pulse. With a temperature of 102° F. it should have been at least 120. By the end of the third day the temperature had dropped to 99.5° F., the pulse to about 80, and every phenomenon characteristic of scarlatina had disappeared. If the case were scarlatina, the disease was aborted, and the characteristic symptoms profoundly disturbed by the surgical complication.

In consideration of the previous attack of scarlatina, and the absence of exposure, I believe it to be more rational to diagnosticate it as scarlatiniform erythema. The etiology of the case is not clear. Toxic absorption from the sloughing wound may have been the cause.

At the autopsy, the reporter attached much importance to the engorged kidneys as confirmatory of the diagnosis of scarlatina. As the report shows, the attending physician found the urine normal two days before the patient's death. The renal congestion must have been, therefore, a late phenomenon, and related rather to the cause of

death than to the exanthem. It was too early for a scarlatinal nephritis to develop.

One cannot look over the literature of surgical scarlatina without being impressed with the confusion that still exists on the subject. From a study of the literature, it appears:

(1) That scarlatina does occur as a complication of surgical operations more frequently than the other specific diseases.

(2) That scarlatina so complicating surgical convalescence sometimes pursues an atypical course.

(3) That many isolated cases reported as scarlatina, and without histories of exposure, do not bear close analysis.

(4) That those cases that have occurred in groups, with clear histories of exposure, and which are undoubtedly scarlatina, have been so carelessly reported that doubt still exists to what extent and in what manner the specific disease is modified by the surgical state.

CASE II. was a sturdy boy ten years old. He had had measles, but neither rubella nor scarlatina. On March 26th, while dressing him, his maid found a rash on his face and neck. I saw him about an hour later. The rash simulated very closely the rash of scarlatiniform rubella. It was distributed over the whole face, neck, and down onto the front of the chest. The forearms and hands were also involved, although here the macules were sparsely distributed. The seat of the eruption burned and itched slightly.

The case bore at this time no resemblance to scarlatina, and the entire absence of constitutional disturbances, conjunctival and nasal irritation, and swollen postauricular glands, excluded rubella. Everything so certainly excluded one of the contagious eruptive diseases that the boy was permitted to join a little class of five boys under the care of a tutor. A cathartic dose of calomel was administered. The child was seen again about 5 o'clock in the afternoon. He had become feverish, the rash had extended, and the parents were alarmed. The temperature was 99.5° F., the pulse 100. There was slight sore throat and a little nausea. The tongue was clean and smooth. The eruption had extended to the upper extremities and body, and both legs, from the hips down, were covered with a bright scarlet rash. A large area, including the lower half of the chest and the upper

half of the abdomen, was free from rash; behind the back was pretty well covered, save a streak between the scapulæ.

In color, and in every other way, the eruption below the neck was a perfect picture of scarlatina rash. On the face it still retained the macular appearance of rubella. There was some itching and burning of the skin. The next morning showed the rash fading from the face, although more brilliant on the body and extremities. Below the waist it involved all the skin of the body and legs; above the waist were large patches of healthy skin. The temperature was 100° F., the pulse 112. The sore throat was better, the pharynx showing but a trifling redness. The tongue was slightly coated, and did not show prominent papillæ. There was no change in the condition of the child during the day. On the following morning, March 28th, the rash was fading rapidly and the constitutional symptoms were gone. He was permitted to be up about his room, and the following morning the rash had gone and he was convalescent. A fine furfuraceous desquamation took place.

At its height this case presented a very close counterfeit of scarlatina. Where present the rash bore a perfect resemblance to that of scarlatina. The large area of healthy skin on the upper part of the body, and the abundant rash on the face, however, were unlike scarlatina. The constitutional symptoms were too late in appearance, and were not commensurate with the intensity and extent of the eruption. The temperature was low, and the pulse comparatively slow. The tongue lacked the characteristic appearance of scarlatina; the sore throat was trifling and transient, and the nausea insignificant.

Considered alone or in connection with some of the associated phenomena, this rash could not be differentiated from scarlatina. With the complete history of the first two days the diagnosis was simple.

The etiology of the case was also obscure. Although there was no history of a distinct error in diet, the boy's maid permitted him liberties that might readily determine food fermentation without toxic absorption. No treatment was employed other than the administration of the calomel and a tepid bath, morning and evening.

457 JEFFERSON AVENUE.

CASES OF ANOMALOUS SCARLATINA.

BY LOUIS STARR, M.D.,

Philadelphia.

In the early spring of 1893, in a family whose four children had been under my continuous observation since their birth, there occurred two cases of eruptive disease, whose characteristics were so peculiar that great doubt arose under what class to place them. Scarlatina was quite prevalent at the time. The first patient, a boy of six years, without prodromes of any kind, without appreciable elevation of temperature, no sore throat, and with a pulse practically normal, developed a slowly-spreading, erythematous rash, presenting very peculiar characteristics to be later described, passed through an apyretic course, and began to desquamate on the sixth day, shedding large sheets of epidermis from an underlying surface of deep red skin. Scarcely had this desquamation begun, when a younger sister of this boy, without prodromata, and with a practically normal pulse and temperature, developed a similar rash, first upon the neck and upper part of chest, with reddened throat and very slight swelling of the cervical lymph glands. Though the rash exhibited peculiarities, the diagnosis here inclined to rubella, until on the sixth day desquamation began; first branny in character, but subsequently in large flakes, especially upon the chest, when the peculiar appearance of the underlying skin noted in the brother's case was seen again, though in less marked degree. While scarlatina was the final verdict in these two cases, the influence of some gouty inheritance might have been accepted as the most probable explanation, had not accident shortly brought under observation another family of three children, the first of whom passed through an eruptive disease presenting exactly the peculiarities of rash of the first two children, with slow pulse and practically normal temperature throughout. He was isolated

from the other children, but rigid quarantine was not maintained. A servant who had come in contact with the child developed distinct scarlatina, and, shortly after, the two remaining children developed typical scarlatina of mild grade. Finally, about the same time as the first three cases, a hospital case was seen which showed a similar rash, ran a mild febrile course, with lameller desquamation, and exhibited nephritic symptoms during convalescence. There is thus to be presented a series of six cases, scarlatinal in character, beginning with one in which there was intense but anomalous rash, without additional symptoms, followed by three other cases of similar eruption, each one adding a few details to the classical picture, until finally two cases occurred in the family of one of these patients which stamp the series with the unmistakable impress of scarlet fever.

CASE I.—John C., æt. six years. Grandparents and parents on both sides gouty in a marked degree. Patient had severe enterocolitis at age of three months, the attack lasting until his seventh month. Had at same time, and for several months after, obstinate eczema, most marked on face and scalp, but extending more or less over the whole body. After this, he enjoyed moderately good health and became robust in frame, but was always difficult to feed, and suffered at times from constipation and indigestion. In December, 1891, in his fourth year, he had an attack of epidemic influenza which lasted fully six weeks, and culminated in parotis, first of the right, then of the left gland. The mumps spread to the other three children of the family. After this attack, though he required careful dieting, he remained well until May, 1892, when, with his sisters and brothers, he had measles, typical in character and course. During the following Summer, he was quite well.

Early in February, 1893, he had an attack of follicular tonsillitis, from which he recovered in a few days, but was left rather feeble for a week. During the next week, his health was perfect. On February 23d, I was called in the evening to see a rash which had appeared after a warm bath. At the time of my visit, the pulse was 88, temperature 98.2°. The tongue was clean and the throat was normal in appearance. The child said he felt quite well, and a careful examination revealed no symptom save the rash. This was confined to the neck and groin. On

the neck, it appeared as a bright, red erythema, its upper edges sharply defined, as if it had extended all round as high only as the collar worn in the day time; below, it faded gradually into the healthy skin of the breast and back. In the groins, the redness was more intense, but toward the margins showed some punctation. The scrotum was involved, so also the penis, and there had been at the last attempt some little difficulty in passing water. The area of skin involved was like a belt around the whole trunk, buttocks and thighs, the lower and upper edges fading gradually into sound skin. The whole of the involved surface was somewhat swollen, the penis and scrotum markedly so, and there was moderate itching.

February 24th.—Rash extended to rest of trunk, but still most intense in original portions. Redness more intense than in ordinary scarlatina, is uniform, punctation having disappeared. Pulse 84; temperature normal.

Feb. 25th.—Rash extending down legs. In advance of redness and over the dorsum of the feet, which are somewhat swollen, but do not pit, cutis anserina is noticeable. Pulse 80; temperature 99°. Scrotal swelling lessening. Creases in groins, and between buttocks quite raw and painful. Patient disinclined to sit up in bed on this account.

Feb. 26th.—Rash extending, but redness still more intense in original portions and over whole trunk. Pulse 86. T. 98.5°.

Feb. 27th.—Hands, feet, and face becoming involved. Palms and soles have a peculiar purplish-red hue, and are very shining. Pulse 86; T. 98.5°. Slight sick stomach and coated tongue; first symptom quickly relieved by calomel in small, divided doses.

Feb. 28th.—Desquamation in sheets over groins, swelling of scrotum gone, and raw surfaces much improved. The skin in places shows empty vesicles about twice the size of a pin's head. P. 86; T. 98.5°. Urine normal, but very acid.

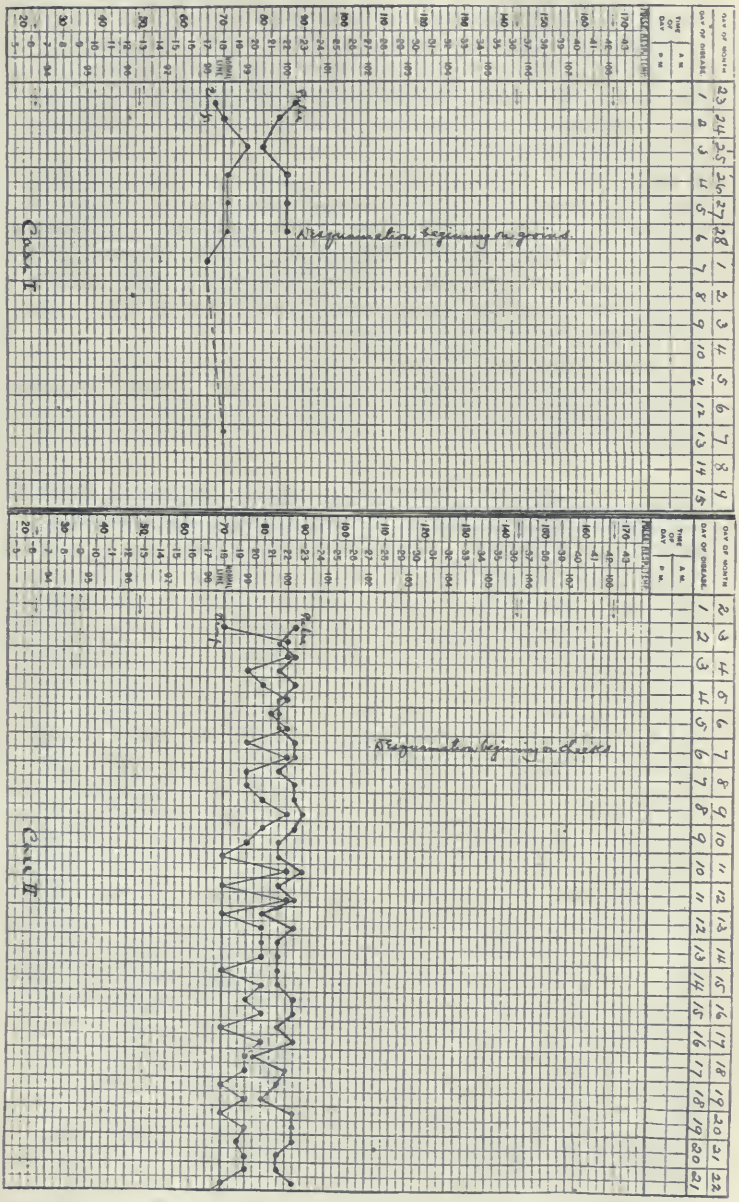
March 1st.—Hands, feet, and face completely involved by the eruption. Desquamation progressing on trunk. The skin bared by the desquamation is extremely red in color. P. 86: T. 98°.

March 3rd.—Appearance of secondary branny desquamation.

March 4th.—Desquamation beginning on legs.

March 6th.—Hands peeling in immense flakes; skin left purplish red.

March 7th.—Face becoming more natural in color;


Case I
Case II
Rash.
Desquamation beginning on the ground.
Desquamation beginning on Face.

hands, feet, and legs very red; trunk still pink and covered with branny scales. Urine shows abundant deposits of lithates. Pulse and temperature normal; tongue clean. Patient clamoring to get up and to have solid food. In places, the new skin shows slightly elevated, purplish-red maculo-papules, and all new skin shows a secondary branny desquamation.

March 9th.—Face looks rather pale; condition in other respects normal. Hands completely peeled, palms intensely red, and skin looks tender, but can be freely handled without pain. Sole of right foot almost completely desquamated, resembling the hands; left sole still intact, but epiderm loose. Surface of rest of body pink, and covered with branny scales.

March 15th.—Improving. Redness less marked.

March 19th.—Practically well. Very slight branny desquamation over trunk. Skin feels soft, and more healthy than ever before.

CASE II.—Hope C., æt. eight years. Sister of Case I. has always been healthy. Had mumps and measles at same time as Case I. No tendency to skin disease. Had slight digestive disturbance during January and February, 1893, and slight bronchial catarrh in the latter month. On March 2nd, 1893, seven days after the onset of her brother's illness, having previously been in perfect health, a rash appeared on the neck and upper part of the chest, coming out after a warm bath. On March 3rd, the rash was a uniform, itching and burning purplish-red erythema, involving chest and back and both cheeks, which were swollen quite perceptibly. The anterior half-arches and tonsils were erythematous; the cervical glands slightly enlarged. Tongue clean; pulse 88. Feels well and takes food well.

March 4th.—Rash extending over whole trunk. Face still swollen.

March 5th.—Rash extending to thighs and arms. Over chest and back, a few slightly elevated, scattered, flat papules of darker color were observed. Urine normal.

March 6th.—Rash extended to knees and elbows. Throat has lost its redness. Tongue perfectly clean. Face not swollen. Below the knees and elbows, in advance of rash, cutis anserina quite marked, as in Case I. Temperature slightly elevated, otherwise no symptoms.

March 7th.—Rash still very well marked over involved surfaces. Branny desquamation beginning on cheeks.

March 9th.—Throat is normal, breast and back desquamating in branny scales; the surface beneath is purplish-

red and somewhat rough. The eruption not developing fully on legs and forearms, hands or feet. The desquamation of the back is branny; on chest, large flakes, but nothing to compare with those in Case I.

March 15th.—Whole surface branny, redness disappearing. Palms and soles somewhat resemble Case I before peeling, but characteristics much less marked.

March 19th.—General condition good. Skin about elbow flexures, inside, red. Hands and feet scaling in large flakes; palms and soles purplish-red.

March 26th.—Desquamation completed, except on soles of feet. Patient a little pale, otherwise well.

March 30th.—Well. Still a little hard skin adhering to heels.

In this case, the temperature ranged between $98\frac{2}{5}°$ and 100°, never rising above the latter point. The details are shown in the temperature chart.

CASE III.—R. T., æt six years, after a winter of quite fair health, was taken suddenly ill on the morning of March 20th, 1893, with sick stomach and one attack of vomiting. At 5.30 P.M., his pulse was 100 and his temperature was 99° in the mouth. An erythematous, somewhat maculated, reddish-purple rash over neck, chest, and upper part of back. Tongue is clean, throat negative. No other symptoms.

March 21st.—Rash extending to whole of trunk; maculation more marked. Pulse 92; T. 98.5°. Tongue clean; throat normal. Considerable itching of skin. Face presents two circumscribed purplish-red flushes.

March 22nd.—Rash extending to flexure of arms and knees. P. 88; T. 98.5°.

March 23rd.—Rash more extended in old positions, centering in places into large maculo papules, thrice the size of a pin's head. P. 88; T. 98.5°.

March 24th.—Desquamation in large flakes over chest, leaving a red surface, here usually uniform, but in places marked by raspberry-red maculo papules. P. 88; T. 98.5. Physical condition apparently perfect.

March 26th.—Desquamation continuing in large flakes. P. 88; T. 98.5°.

March 29th.—P. 88; T. 98.5°, but rash is still evident on back. Desquamation universal. Where it first began there is now secondary desquamation in branny scales. In the flexures of the joints the skin is peeling in large flakes, leaving a red surface, either uniform or mottled with large

maculo-papules, raspberry red. This is especially shown in the axillæ and on elbows and knees.

April 25th.—Desquamation just completed. Perfectly well, as he has been since last note.

In this case, the desquamated flakes of skin were not so large as in the C. cases. During the course of the illness, the skin felt somewhat hot to the touch, though the thermometer showed no actual rise in temperature.

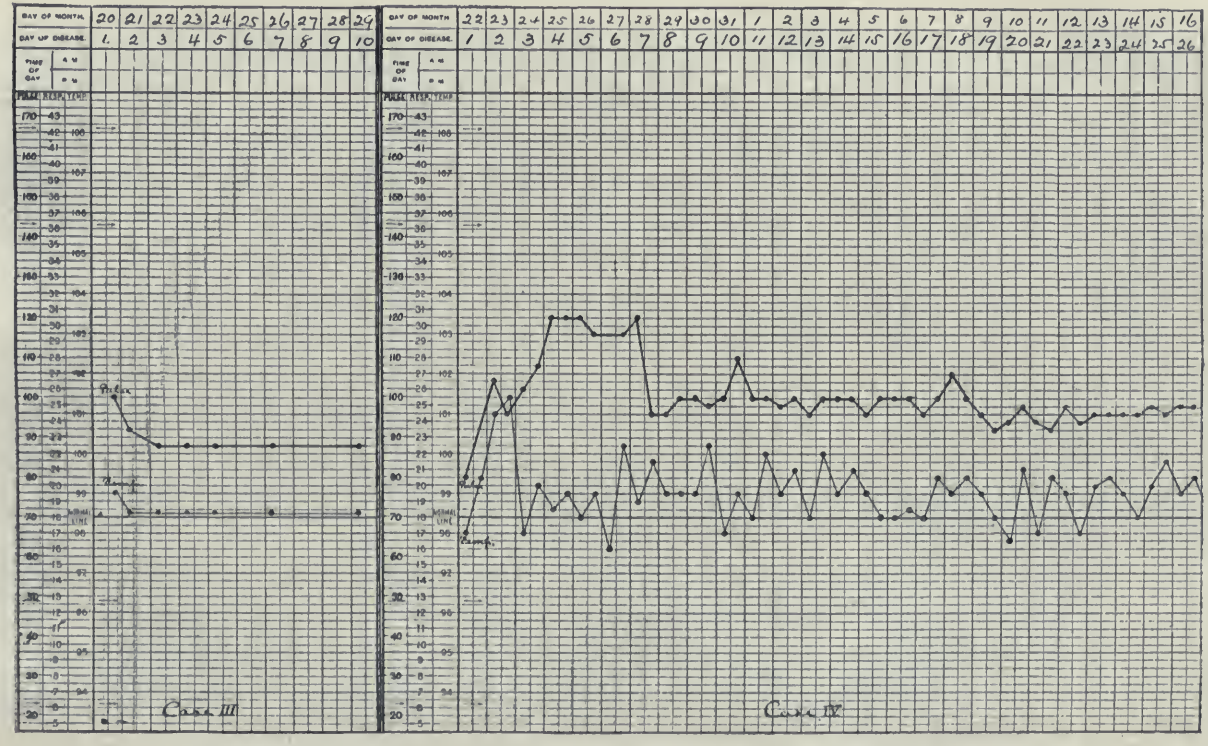
CASE IV.—Edward C., æt. five years, a patient at the Children's Hospital, was admitted for vesical calculus, and had a cutting operation a few days later. On March 22nd, 1893, shortly after the occurrence of Cases I. and II. in my private practice, he was transferred to the medical ward on account of the appearance of a scarlatinous eruption. In this case the rash was very similar to that in Cases I., II., and III., but there were in addition a red and slightly swollen throat, moderate fever, and a higher pulse rate. (See Chart.) The course was more prolonged, and at the end of the third week there was a slight puffiness of the face and feet, the elimination of urine was diminished, and this fluid presented the features to be observed in scarlatinal nephritis. The desquamation also occurred in large flakes, the hands yielding a glove-like cast similar to that photographed from Case I., and the new skin exhibited the deep red color noted in the preceding cases.

CASE V.—Charlie T., æt. four and a half years, brother of Case III. Illness began on the evening of May 2nd, 1883, with vomiting and heat of head. A scarlatiniform rash appeared next day, at first indistinct and deep under the skin. Throat was normal; tongue characteristic. Palms and soles purple red; face flushed purplish-red. No severe symptoms. Very moderate elevation of temperature on first day, and increase of pulse rate for four days.

May 4th.—Rash all over body.

The subsequent course of this case was that of a mild, but perfectly distinct scarlatina. Desquamation began on the twelfth day. On the fourteenth day, the glands at the angle of the jaw on both sides were swollen, the left the greater, reaching the size of a walnut.

CASE VI.—Richard T., æt. three years, brother of Cases III. and V., was taken ill on May 5th, 1893, three days after his brother Charlie. No sickness of stomach, but


DAY OF MONTH
DAY OF DISEASE
TIME OF DAY
A M
P M
PULSE. RESP. TEMP.
NORMAL LINE
Case III
Case IV

redness of fauces. The rash was typically scarlatinal and the course uneventful, desquamation beginning on the 14th day. Moderate elevation of temperature and increased pulse rate up to sixth day.

The two cases of this series which stand by themselves are Cases I. and II., brother and sister. Every probability, after excluding possible sources of two distinct infections, warrants the conclusion that both children were suffering from the same disease, no isolation between these two having been maintained, and the girl becoming affected with a very similar eruption seven days after her brother. Whatever can be accepted for one case must, therefore, be accepted for the other, and symptoms of the one must be weighed carefully with those of the other. Judging from the doubtful rash alone, the slow pulse, the practical absence or insignificance of fever, and the general well-being of these two children, rubella would have been a natural and convenient conclusion. Particularly as Hope, the second child affected, had besides a slight sore throat and slight enlargement of the cervical glands, though this enlargement was not at all marked, had to be sought for with great care, and was only found in the post cervical chains. The type of the subsequent desquamation, however, was distinctly scarlatinal, the empty vesicles in the peeling skin being quite marked in portions of the skin in Case I., and the skin in many portions coming off in large sheets.

Clement Dukes, in a paper read before the Medical Officers of Schools Association, in February, 1894, states in regard to rubella that the desquamation is always in small scales, rather than in flakes or sheets, and this is in accord with my own experience.

The infiltration of the skin noted in both cases, is also a feature of scarlatina which is wanting in the rubellous rash. The short period of incubation for the second case also militates strongly against rubella.

From the relapsing scarlatiniform erythema of Fereol, diagnosis was even more difficult. Desquamation, however, in both my cases did not begin till the sixth day, while in erythema it occurs earlier, on the third or fourth

day; and infiltration of the skin does not occur in erythema. Again, the occurrence of a second case of similar eruptive disease seven days after the first, in children in previous perfect health, points strongly to the presence and communication of an infection of short incubation, rather than to the operation of some possible common cause capable of producing a secondary erythema.

Measles, while scarcely to be thought of in this connection, can be excluded by the fact that both children had passed through an attack under my care, a year previously.

A point of some interest in this connection is the fact that the father of these children has never taken scarlatina, though directly exposed on several occasions in youth; and the mother had the disease in the lightest possible form when her brothers and sisters were seriously affected. Much stronger grounds, however, for deciding on scarlatina, were finally given by the other two cases observed shortly after these. About the time that Case I. and II. were recovering, Case III., Robert, the oldest boy of the T. family, was taken ill suddenly with vomiting, but with scarcely any elevation of temperature (99° in the mouth), a pulse of only 100, and no throat symptoms. The rash was so like that of Cases I. and II. that the course of the disease was watched with great interest. The history already given, and the temperature and pulse chart show how close was the similarity to Case I. Two days after his first seizure, a fourth case occurred at the Children's Hospital; the rash presented the same characteristics as the preceding cases, but the temperature and pulse were higher, there was sore throat, and finally a mild attack of nephritis during the convalescence. Meanwhile, in the T. household, a servant who had come in contact with the isolated boy developed a distinct case of scarlatina and was sent away, while, a few weeks later, the two remaining children came down with scarlatina, of mild degree and practically febrile course, but presenting no difficulty in diagnosis. In this instance, the mother had frequently left the sick

room of the eldest child and had mingled with the younger children.

The rash in the first four cases possessed many points of resemblance. In Case I, the early eruption about the loins was punctate when first observed, and this was also noticeable in Case III over the neck, chest, and back. The reddish-purple tint in some regions was observed in the first three cases, most distinctly in Case II, where the first regions affected were tinted a purplish-red, as also the palms and soles; the palms and soles of Case I were thus marked, and Case III also showed the tinting, which was here rather reddish-purple, over the neck, chest and back. Case V, which was undoubtedly scarlatina, also showed the purplish-red color on the palms and soles, and on the cheeks. The desquamation in all four cases was such as I have never seen but in scarlatina. In I and II, there were veritable sheets of dead epidermis thrown off. The new skin, as shown most truthfully in water-color sketches, kindly made for me by Dr. J. Madison Taylor, from Case I, was remarkably red, even purplish-red in places in all four cases. The purplish tint was marked in Case II, which had shown this coloring most decidedly in the early eruption. The occurrence of darker macules or maculo-papules is also noteworthy. In Cases II and III these were quite distinct on some parts of the chest and back, during the eruption, while in Cases I and III, especially the latter, they formed a marked contrast with the red, new skin surrounding them.

An examination of the literature has offered little light upon these cases. Eustace Smith, however, states that in scarlatina the rash may be dusky and purple, and that sometimes dark red papules may be observed.

In regard to the pulse-rate, it seems the general consensus of opinion that even when the temperature shows no appreciable elevation, the acceleration of pulse is noticeable. In Cases I and II, the pulse never exceeded 88, and in Case III rose only on the first day to 100. This is difficult to explain, as is also the low temperature, especially in the presence of so marked an involvement of the skin as all these cases exhibited.

1922 SPRUCE STREET.

THE LOCAL TREATMENT OF THE SKIN BY ICHTHYOL OINTMENT IN SOME OF THE ERUPTIVE FEVERS OF CHILDREN.

BY A. SEIBERT, M.D.,

New York.

In the winter of 1893-94, I had an opportunity to treat a case of malignant erythema nine weeks, which was accompanied by a quotidian and tertian type of fever, showing temperatures ranging between 98.5° F. and 105° F. No enlargement of the spleen was found, and also no plasmodia in the blood. The erythema showed marked infiltrations of the skin, varying in size, but in the average about one-eighth of an inch in diameter, coming and disappearing within twenty-four to forty-eight hours. The color of the spots was a dark red, changing into bluish-purple before disappearing.

Large doses of chinin and of salicylic soda, as well as the hypodermic injections of a two per cent. carbolic acid solution (suggested by Dr. Janeway in consultation), had no effect upon the fever and the erythema. At the end of the eighth week of the illness, when my own patience as well as that of the sufferer were nearly exhausted, I came to the conclusion that the high temperatures were due to absorption of pathogenic material from the erythematous infiltrations in the skin, and, as the internal treatment of the case had failed completely, that it was both rational and justifiable to attempt to reach the bacteria causing the trouble by germicidal treatment of the skin, where they were causing inflammatory conditions of the capillaries.

A somewhat extended experience in cases of erysipelas, beyond the stage of surgical interference (by drawing a bloody line according to Riedel-Kraske-Lauenstein) had taught me the value of enunctions with ichthyol-lanolin ointment. As the bacterium causing this attack of malignant erythema was not known, it was barely possible

that the same might be acted upon by the ichthyol. A five per cent. ointment of ichthyol was therefore rubbed well into the entire skin of the patient, from the toes to the scalp, two ounces being used daily. After the first enunction but one more short rise of the temperature to 103.5° F. occurred, and from that day on the rise gradually decreased in extent, so as to leave the patient free of fever and of the erythema at the end of the following week, seven days after the first enunction. [The only cases of malignant erythema I have seen reported, are described in *Polotebnoff's* monograph "Zur Lehre von den Erythemen," *Monatshefte für praktische Dermatologie*, 1889.

This experience in an adult induced me to use ichthyol ointment in the following eruptive fevers of children :

(1) *Erythema nodosum.* In this affection a liberal enunction of a five per cent. ichthyol ointment into and around the infiltrations of the skin made twice daily, has practically terminated every case I have since treated (ten in all) within forty-eight hours. The fever and the pain subside within a few hours after the first enunction.

(2) *Peliosis rheumatica:* Here also this method has been of decided benefit to my patients. The change for the better within twenty-four hours was marked by the decline of the temperature and the intensity of the redness of the affected parts. So far five cases were treated.

(3) *Scarlatina.* The most valuable services though this ointment has rendered me, I have found in cases of scarlatina. In the fall of last year I treated a boy, two-and-one-half years of age, during a severe attack, which gave rise to intense inflammation of the cutis, the temperature running between 194° and 105.6° F., and marked restlessness and insomnia for four days. As the throat was but slightly involved by necrosis, as the lymphnodes were but little swollen and no albumen was found in the urine, I took it for granted that the restlessness and the high temperature were due to the intense inflammation of the skin. At noon of the third day of the eruption, an ounce of a five per cent. ichthyol-lanolin ointment was rubbed into the cutaneous surface of the entire trunk,

while the temperature was at 104.5° F. One hour after the enunction had been made, the child became rested, the fever subsided, and two hours later the child slept quietly, with a rectal temperature of 100.2° F.

Another enunction applied over the whole body the next day had the same beneficial effect, and the child made a speedy recovery.

It has been my misfortune to see but few cases of scarlatinal dermatitis during the last nine months—in all, but eleven, but in every one I have noticed the marked effect of these enunctions upon the local condition of the skin, the rapid decline of the fever, and the general condition of the child. Drs. Baron and Bartels, of my staff at the New York Polyclinic, have had occasion to try this method in a number of cases of scarlatina, and their experience coincides fully with my own, so that in all we have seen the above effect in eighteen cases.

The change for the better in the patient is very striking. The swollen, red skin shrinks and turns pale brown; the temperature declines from three to four degrees within two hours, and the nervous, itching, peevish child becomes quiet, better humored, and usually goes to sleep without coaxing.

In parenthesis I will here state that I have also used this ichthyol treatment in a few cases of measles with good results, regarding the itching and restlessness of the children. I do not believe that this treatment has any speific effect upon the character of the general infection in scarlatina, so as to change a malignant case inlo a mild one, as Curgeven claimed for the enunction of the oil of eucalyptus in 1890 (*Medical Magazine*, 1892, Vol. I., pp. 729 and 1150), but I am convinced that the ichthyol ointment applied in these cases destroys most of the bacteria causing scarlatinous dermatitis, and thereby materially aids the patient in overcoming the general infection.

Unna has established the fact that ichthiol ointment causes the capillaries of the skin to contract, especially when they are abnormally dilated, and Abel, in a series of experiments, in the Hygienic Institute at Greifswald, in 1893, has found that certain bacteria (like pyogenic strep-

tococci and the streptococci of erysipelas) are very susceptible to the contact with even weak solutions of ichthyol, while again other germs (like the staphylococcus aureus and albus, the bacillus pyocyaneus, the bacilli of typhoid, ozæna, and anthrax, and the spirillum of Asiatic cholera) resist the action of this remedy to a more or less marked degree.

In scarlatinous dermatitis we have abnormally dilated capillaries of the skin, and so far but streptococci have been found. Ichthyol acts on both, according to Unna and Abel, and therefore it deserves an extended trial.

114 EAST FIFTY-SEVENTH STREET.

DISCUSSION ON SCARLATINA.

Dr. J. P. Crozer Griffith : Dr. Blackader's paper has covered nearly everything which I would have said, and there is but little for me to add. Attention has not yet been called to the fact, that there is such a thing as a tonsillitis attended by an erythema. Such a combination is especially difficult to distinguish from scarlet fever, since it exhibits the same combination of sore throat, rash, and fever. In a day or two, however, the erythema disappears and the difficulty in diagnosis is removed. I well remember a case of this nature, which I saw in the hospital of the University of Pennsylvania some years ago, and which was the source of much anxiety for the first twenty-four hours. The occurrence of erythema with tonsillitis is, in my experience, uncommon, and I can find little reference to it in text-books; yet it is a combination which we would naturally expect, when we remember that both tonsillitis and erythema are often rheumatic manifestations. I have known of cases of wide-spread erythema, which greatly simulated scarlet fever at first, but which was later accompanied both by joint involvement and endocarditis, thus proving the rheumatic nature of the cutaneous eruption.

The question of the so-called "surgical scarlet fever" is an interesting one. Some writers maintain that it is merely scarlet fever occurring in a surgical case. The balance of opinion, however, is that with which my own accords, *i. e.*, that it is a septic erythema. Cases of this nature are doubtless common in the experience of all of us. They are capable of giving rise to great anxiety at

first, particularly where an apparently scarlatinal eruption appears in a hospital ward.

I remember one case of wide-spread erythema, not of septic origin as far as discoverable, in which a child was covered by a blush so vivid and so little puncture, that it resembled erysipelas rather than scarlatina. By the next day the eruption had disappeared totally. The distinction is sometimes drawn that the rash of scarlet fever is followed by desquamation of a peculiar sort—a peeling of the skin—whereas erythemata are not. This is certainly true in the majority of cases and is a very valuable guide. Even when an erythema does produce desquamation, it is rather in fine scales than in large flakes. There are, however, very pronounced exceptions to this rule, and we can all recall the condition going by various names, instances of which have been reported by various writers. There were, for instance, some very interesting cases reported, with plates, by Blanc, a few years ago, in which the skin was shed from the hands almost in the form of perfect gloves. It has never been my fortune to see a case as perfect as this, but I certainly have seen a desquamation following septic erythema, which was entirely similar to that of scarlet fever.

It is not often that the rash of scarlet fever resembles that of measles in any degree. Sometimes, however, in malignant cases it may be very blotchy, and limited in extent, and strongly suggest the rubeolous eruption. I want, on the other hand especially, to emphasize the very close resemblance which the eruption of rubella often bears to that of scarlatina. In an article in the *Medical Record*, published a number of years ago, I called particular attention to the fact, that, although typical rubella had a typical eruption, there were two very distinct variations, which could be called *Rubella morbilliform* and *Rubella scarlatiniform.* These were not distinct diseases, as Filatow had suggested, but were varying forms. The first of these is so like measles, that it cannot be differentiated in sporadic cases; while the second can hardly, if at all, be distinguished from scarlet fever, so far as the rash itself is concerned. It is true that careful examination of the eruption of rubella scarlatiniform will generally reveal the true nature. However uniformily red the rash may be over the greater part of the body, in the regions of the wrists and ankles, and the fingers and feet, we can usually find a distinct macular appearance upon a uniformly red base. Yet this is not always the case, and sometimes, too, the rash of scarlatina shades off at the extremities, and tends to be a little uneven and blotchy

there, so that this diagnostic test is by no means infallible. I freely confess, that I have more than once mistaken one of these two diseases for the other; and, indeed, I do not believe, that it is possible, in some cases, to distinguish them early in the attack.

The enlargement of the superficial cervical glands, which has often been quoted as a diagnostic sign of rubella, is by no means so. A few years ago, I looked into the matter carefully, and found that these glands were quite commonly enlarged in measles also, and then published my results. Still further study showed, that these glands are not at all rarely enlarged in children, who are apparently healthy, and quite frequently so in those whose health is below par. It is only another instance of the fact that we often fail to find a symptom, because we do not look for it. We all search for the enlarged glands in rubella, and fail to search for them in rubeola; and therefore overlook them. This same glandular enlargement may be present in scarlatina. I do not, of course, mean to say, that there is not a very special disposition to the enlargements of these glands in rubella.

To sum up, it is a matter of fact, that there is no one symptom upon which the diagnosis of scarlatina can be infallibly based. Certainly not upon the rash, for this may be simulated by various erythemata as well as by rubella; not the peculiar desquamation, for this, too, is not perfectly reliable; not the fever, nor the pulse. It is only upon the complex of symptoms that we can rely. These will usually guide us aright, but not invariably so.

Dr. Augustus Caille: A practical question is, Can we differentiate between contagious and non-contagious skin diseases? In our hospital, it is the chief duty of one person to keep out contagious diseases, and I have endeavored to educate myself up to that point. While in the majority of cases I would be able to tell, occasionally one appears in which I am unable to decide. As regards the communication of Dr. Seibert, I would say that I have once used ichthyol in pemphigus and found it irritating. In eruptions, where there is no open surface, it would probably be good.

Dr. Henry D. Chapin: A rash sometimes accompanies tonsilitis that resembles that of scarlatina. That rash disappears about the second day, and there is no desquamation. In many cases we cannot tell whether the child has a mild form of scarlatina or not. I was recently called to see a little girl with a rash upon her back and chest.

The tonsils were slightly enlarged. As the child had poor digestive powers, I believed the rash to be due to that cause. In about a week, her brother had a marked attack of scarlet fever, and I had to admit that I had made a wrong diagnosis in the first case. The point made by Dr. Jennings in reference to the pulse I have not observed, but if it is of the value he says, it would certainly be helpful in the diagnosis.

Dr. J. C. Wilson: There are two points, which have not been spoken of, that have seemed to me important in the diagnosis of scarlet fever. The first is, that occasionally in young subjects in the first week of enteric fever, an erythematous condition of the skin is encountered, which can scarcely be differentiated from scarlet fever. The erythema and absence of fever leads to extreme difficulty in diagnosis. In two or three days, usually, the rash disappears, and about this time the enlargement of the spleen makes the diagnosis clear. The other point is the large number of cases of scarlet fever, attended by large patches of rash corresponding to descriptions of the rash of scarlatiniform rubeola. This is especially common in adults.

Dr. John Dorning: We are all forced to the conclusion, that there are some cases in which a diagnosis is very difficult. It has been stated in some text-books, that enlarged post cervical glands are pathognomonic of rubella. How do we know that the glands were not enlarged before the attack? Why should they occur in rubella more than in scarlet fever?

Dr. A. Jacobi: The condition of the throat certainly proves nothing, for we have a similar throat in many diseases. Dr. Blackader has said that intestinal erythema is never attended with fever, and that the absence of fever is pathognomonic to a certain extent. I remember a case in which a child had been having fevers for several months, several times accompanied by an eruption. When I was called to see it, there were temperatures of from 102° to 103° F., and a general erythema. I found both to be undoubtedly the result of intestinal intoxication. So the absence of fever in such cases is not a positive guide. As far as desquamation goes, a number of years ago, a physician of New York, well informed and a good observer, speaking of the repetition of scarlet fever, said he had seen it in one and the same person, at that time an adolescent girl, twenty-three times, the whole body desqua-

mating each time. I am certain, that every one of the attacks was of neurotic origin. The peeling of large patches then is not conclusive either.

Dr. S. S. Adams: I agree with those who have said that we have no symptom or group of symptoms upon which we can rely for positive diagnosis. In the doubtful cases the question of quarantine becomes an important one. I am an advocate of quarantine, and think it much wiser to do this in doubtful cases than to subject other members of the family to the possibility of contagion.

Dr. J. H. Fruitnight: Recently I was called to a boy, said to be ill with scarlet fever. He was covered with an eruption, had a temperature of 101°, was wildly delirious, and complained of burning in the throat. The throat was found to be very red and the pupils were dilated. I advised his mother that it was not scarlet fever, but more likely belladonna poisoning. He was given sedatives, and on the following morning confessed to having eaten some leaves which I found to be stramonium. In reference to such cases as Dr. Jennings spoke of, I remember a young lady who had five attacks within five years, always occurring in the Spring. She said to me: "I have not scarlet fever, although desquamation occurs with every attack, and the first three times the doctors called it scarlet fever." It certainly had the appearance of that disease, but I think it was a neurotic condition of the skin. Germane to Dr. Wilson's paper, I would report a case that occurred to me: A child had scarlet fever, which was followed by extensive sloughing on the right side of the neck, and the carotid artery was exposed to view. Rupture of the artery caused death.

Dr. A. A. Macdonald: With regard to the belladonna rash, some weeks ago, in the Infants' Home at Toronto, atropine was given to some of the children for whooping cough, from which many of them were suffering. A characteristic scarlatinal rash appeared in many cases, with elevation of temperature and rapid pulse. In the poisoning of belladonna we have not the rapid pulse of one showing great depression. I think it is best to quarantine doubtful cases simply as a protective measure.

Dr. George N. Acker: I have a patient, who, since childhood, has been subject to frequent attacks of pain, rapid pulse, and intense redness of the skin, followed by desquamation of the whole body. The attacks were diag-

nosed as scarlet fever by many physicians. Others concluded that they were due to intestinal trouble, and calomel was administered. He had no attack for some years, but later, neglecting to take the calomel, the attacks returned. He has had but two attacks since 1876.

Dr. Louis Starr: I wish only to add my testimony as to the enlargement of the cervical glands. I have found them enlarged in many other conditions than rubella. I have seen within the past two weeks cases of measles with enlarged glands all over the body.

A CASE OF SYMMETRICAL GANGRENE OF THE FACE AND SACRAL REGION FOLLOWING SCARLET FEVER.

BY J. C. WILSON, M.D.,

Philadelphia.

I saw, in consultation with a medical friend, October 22, 1893, in a small town in New Jersey, a case of rapidly developing gangrene of the face and sacral region occurring after scarlet fever. This sequel of scarlet fever must be extremely rare; for this reason I desire to place it upon record. The notes are, unfortunately, owing to the circumstances in which the case was seen, incomplete.

The patient was a lad six years of age, who was seized with scarlet fever, during the prevalence of a local epidemic, upon September 28th. The case was described as quite severe, the form being scarlatina anginosa. The patient, however, did well, and was permitted to get out of bed about the tenth day, namely, October 7th. From this time, for a period of ten days the child seemed well, had a good appetite, normal secretions, and the urine is stated to have been free from albumen. There was abundant desquamation.

Upon October 17th the superficial cervical lymphatics began to swell. They were much enlarged upon the following day. Upon the 19th there were severe pains in the legs and ankles, with an abrupt decrease in the quantity of urine voided. Upon the 20th there was almost complete suppression of urine, with great pain along the urethra, intensified upon every attempt at micturition.

Dropsy of the face and of the feet was absent. The temperature ranged between 101°–102° F. Upon the 21st the urine was slightly increased in quantity and there was less pain in voiding it. It was smoky in color and highly albuminous. To the question "What was the amount of urine passed at a time during the last attack, and what were the intervals between the passing of urine?" the physician in attendance subsequently wrote as follows: "October 20th the quantity was very small, not more than a drachm, until evening, when about two ounces were voided at once. October 21st, in the morning, about two ounces, and about the same quantity in the middle of the day; a smaller quantity in the evening. October 22d, four ounces in the morning. The last voided."

On the morning of the 22d of October, the child complained bitterly of pain in the sacral region and buttocks. Upon examination at 7.30 A.M. the skin was found to be of a deep purplish color, almost black, over an area in the sacral region about two inches in diameter. Around the discolored portion there was a narrow, pink, inflammatory border. About noon upon the same day nose-bleeding appeared, at first profuse, afterwards slight, and continuing until death. Shortly after epistaxis began, discoloration of the nose showed itself. There was at first lividity, attended with great pain. In the course of an hour the greater part of the nose had become bluish-black, the area of discoloration being surrounded by a narrow inflammatory zone. These changes rapidly extended and invaded the cheeks. I saw the patient about 6 P.M. the same day. His condition was as follows: Temperature 102.5° F., pulse feeble, rapid, counted with difficulty; about 180. The position was that of right lateral decubitus; legs and thighs strongly flexed. Mind perfectly clear, though small doses of morphia had been administered. Nourishment was refused. There was complaint of thirst, which was relieved by occasional sips of dilute brandy and water; nausea, but no vomiting. Tongue was dry, smooth, and bright red. The patient complained of pain in the face, the lower part of the back and legs and ankles, and expressed great distress on the slightest effort at movement. Auscultation of the heart yielded unsatisfactory results. Percussion resonance over the chest was clear. The face and eyelids were slightly œdematous. An irregularly symmetrical area of bluish-black discoloration of the skin occupied the nose nearly to its tip, and spread for an inch to the right and an inch and a half to the left side of the face. An

area of similar discoloration, larger in size, also irregularly symmetrical, about three by five inches in diameter, occupied the sacral region, extending down toward the buttocks. This area was likewise surrounded by a narrow inflammatory zone beyond which the skin was slightly œdematous. There were no other gangrenous spots. The skin over the discolored portions was dry and lustreless, presenting the appearance seen in rapidly

forming dry gangrene. At the borders, however, there were here and there minute blebs without oozing. I learned by letter that the patient died at half-past six o'clock on the following morning, the swelling and discoloration of the face continuing meanwhile to increase, involving the eyelids, the alae of the nose, and the upper lip. The patient's mind remained clear until about an hour before death. No post-mortem examination was made.

The patient was an only child, without history of pre-

vious disease. His parents were in good health. There was no hereditary tendency to anæmia or hemorrhage.

Davies (*British Medical Journal*, Feb. 28, 1891), reports a similar case. It is of sufficient interest in this connection to be quoted in detail: F. S., aged nine years, at the end of the third week of an attack of scarlatina, while freely desquamating, awoke on the morning of November 10, 1890, apparently well. At 9.30, he complained of violent pain in his lower limbs, which were found to be cold, puffy, and very tender to the touch. Spots then first appeared on the shins, both calves, and the dorsum of the left foot. The maternal grandfather of this child died of hemorhagic smallpox. Members of the mother's family "bled easily." Two years previously, F. S. suffered from "general debility." He had suffered four years before from measles, chicken-pox, and had nose-bleeding on slight provocation. At the time of the attack of scarlet fever, his general health was good. The scarlet fever had been severe, rash well developed, lasting six days, followed by prompt desquamation. Four hours after the attack of pain, Dr. Davies saw the child. He was then anæmic; desquamating freely; mental condition good; temperature, bowels, and urine normal; pulse, 100; irritable. Feet and legs to the knee were slightly œdematous; the surface was warm. There were patches of ecchymosis about both ankles. Both calves were covered by bluish-black subcutaneous hemorrhagic patches, surrounded by narrow zones of inflammation; were very tender to the touch. The following day, November 11th, at 9.30 A.M., the temperature was normal, skin moist and very pale; the urine scanty, but normal; pulse 120; the extremities warm. The discolored patches were now merged into extensive raven-blue areas, surrounded by inflammatory zones. The symmetry of the patches was remarkable. The legs were slightly less œdematous, but exceedingly painful, and the child shrieked if they were moved or roughly handled. New ecchymodic patches appeared upon the legs and on the right hip, their development being preceded by great local pain. There was no enlargement of the joints. At

DR. DAVIES' CASE OF SYMMETRICAL GANGRENE. (*British Medical Journal.*)

1 P.M., the patches ceased to increase, except those on the right hip and the dorsum of the left foot, which were spreading rapidly. The bruise-like ecchymosis had appeared at the tip of the left elbow, which was very painful. There was no swelling of the left elbow-joint, though movement was attended with great pain. The patient's mental condition was clear; there was no fever. At 4:30 P.M. the patches were spreading rapidly, there was considerable swelling of the left elbow-joint, with marked discoloration. The slightest movement of the joint caused intense pain. There was at that time slight fever and the pulse was 140. The patient was removed to the Homerton Fever Hospital, the patches continuing to spread and new centres forming in other parts, together with swelling of one ear. The patient died on November 12th, about noon.

The result of the autopsy, which was conducted by Alexander Collie 48 hours after death, was as follows: Some blood-stained fluid in each pleural cavity, rather more on the right side; lungs anæmic, otherwise normal; heart contained no clots—its walls thin and flabby; liver and kidneys anæmic; spleen not enlarged; intestines anæmic, walls very thin, containing a little fecal matter; bladder contained only a few drops of urine; no fluid in peritoneal cavity; no extravasation of blood in any internal organ, and no abnormality except anæmia; tonsils congested in patches. Upon removal of brain, arachnoid milky; convolutions somewhat flattened; small quantity of serum in ventricles. Nothing further detected.

Dr. Reginald Southey, Transactions of the Pathological Society of London, Vol. xxxiv., Dec. 5, 1882, reports a case of rapidly developing symmetrical gangrene in a child two years and nine months old:

S. C., the only child of young parents, was brought to St. Bartholomew's Hospital December 3, 1882, at noon. The patches of black, purple lividity, symmetrically situated upon both buttocks and both legs. Her face and the rest of her skin presented an ashen pallor. The child was perfectly conscious, but suffered no pain except from movements of her limbs. Axillary temperature 99.4°F.;

pulse 120, small and wiry; heart sounds clear, regular; impulse feeble; respiratory movements and auscultatory signs over the lungs normal. The urine was albuminous, without casts or blood. After a hot bath convulsions developed, which persisted, with slight interruptions, until death, which occurred 32 hours after the appearance of the first patch of discoloration on the calves of the legs. Upon post-mortem examination the blood in the heart and elsewhere was dark in color and fluid; no coagula,

DR. SOUTHEY'S CASE OF SYMMETRICAL GANGRENE.

thromboses or embolism were discovered; no visceral lesions were found. The spleen was slightly enlarged, dark colored and soft. The gangrenous areas showed upon section that the skin and connective tissue were chiefly, if not solely, the seat of stasis and extravasation. The muscles were blood-stained about their sheaths, but not in their substance. Blood-coloring matter and corpuscles, together with blood serum, poured out into the affected parts, which presented the appearance of a great bruise. There was no effusion into any joint.

The father of this child was thought to have been a

subject of congenital syphilis. He had suffered from vomiting of blood about the time that the subject of the present history was about six months old. S. C. had been apparently in good health until the October preceding her death. At that time she had an attack of febrile purpura, attended with pain in the head, legs and feet, and the appearance of crimson spots upon the ankles and calves. She was kept in bed for a few days, during which she was feverish and fretful, and vomited. The middle of November she again suddenly became feverish, lost appetite, was languid and drowsy, and slept continuously for the better part of three days. She then rapidly improved and remained in good health until the sickness of which she died. This illness began abruptly, two days before the child came under observation, with a headache. The following day she complained of pain in her legs, and the father observed a slight colored patch on each calf surrounded by a red margin. These patches rapidly extended and became darker in color. Vomiting developed. About 3 A.M. December 3d, symmetrically livid and purple patches appeared on the posterior aspect of each arm two inches above the elbows, and at 6 A.M. the parents first observed two similar but larger and blacker spots on the buttocks. The mother stated that the child's bowels were generally freely opened, and had acted that morning naturally. She had also passed a little red, thick cloudy urine. The presence of blood in the urine or bowels had not been observed upon that day or at any previous time.

Rapidly developing local gangrene as a sequel of the acute febrile infectious diseases has been frequently noted; more frequently by Continental than by English or American observers. Gangrene of a member, usually the leg or foot, as a result of embolism or thrombosis, has also been observed, but it is still more rare. These gangrenous conditions occur chiefly after enteric fever, scarlet fever, cholera and influenza. The distribution of the lesions, and their relation to vascular areas render their pathology intelligible. The arrest of blood supply by: 1, an embolus; 2, a thrombus arising from disease of

the intima; or, 3, in consequence of prolonged angiospastic states may be followed by necrosis of the part, the destructive changes being intense and rapid in proportion to the nature and degree of antecedent blood or tissue-infection, and the impaired nutrition of the tissues from acute disease. My own case and those of Drs. Davies and Southey rest upon a different pathological basis. It is unfortunate that no studies of the blood were possible. In my case there were no evidences of hemophilia or other antecedent disorder of the blood or vessels. In the other two cases it may be assumed, although the data are not precise, that hereditary tendencies of this kind existed. The intervals elapsing between the beginning of the attack of scarlet fever, and the sudden onset of the gangrenous process in two of the cases is suggestive, being in each instance three weeks, while the interval between the attack of "febrile purpura" and the development of gangrene in Dr. Southey's case was less than three months. The acute symptoms in my case were enlargement of the superficial lymphatics of the neck, prolonged epistaxis and fever; and the marked constitutional symptoms in the other cases indicate a sudden profound change in the condition of the blood, probably a secondary infection. The drawings indicate that the superficial symmetrical gangrene was to some extent at least due to pressure, though this explanation does not hold good for the gangrenous patch upon the nose and cheeks in my case. Careful inquiry gave no ground for the suspicion that either in consequence of the bleeding of the nose, or for any other cause, there had been undue pressure upon the integument of the face.

1437 WALNUT STREET.

DISCUSSION.

Dr. A. Jacobi: I have never seen symmetrical gangrene. It struck me as strange that more cases were seen after measles than after any other disease.

Dr. Wm. Osler: Clinically there are three groups of these cases of spontaneous gangrene: First, the febrile or post-febrile, seen most frequently after scarlet fever, measles and typhoid fever; purpura is not, so far as I

know, a feature of this group. Second, cases of local gangrene in association with extensive purpura. Third, Reynaud's disease, in which the necrosis affects the extremities, most commonly the fingers or toes, but sometimes larger portions of the limbs.

OSSIFIED CEPHALHÆMATOMA.

BY FRANCIS HUBER, M.D.,

New York.

The common form of cephalhæmatoma, due to extravasation of blood under the periosteum, usually presents, or is characterized by a firm ridge at its circumference. Ordinarily it shows itself within a few days, in some cases only after a week or two, and its presence is due to the bone-forming function preserved by the uplifted periosteum. If examined at this period for the first time, the firm outer rim contrasted with the elastic, yielding nature of the central portion of the swelling may lead to the impression that we are dealing with a depressed fracture or defect in the bone. An error in the diagnosis is possible if this point be forgotten. In fact, such a case came under my observation but a short time ago.

Sometimes, in cases which have lasted from four to six weeks, thin plates or bridges of bone form here and there in the most prominent portions of the fluctuating tumor, giving rise to the sensation of crepitation when palpated, or even simulating the parchment-paper crackling of cranio-tabes. In rare instances adventitious bone thus formed may persist and form a large bony crater at the vault of the skull.

In the general run of cases, after the lapse of a few weeks or a month, the fluid portions are gradually absorbed and a more or less complete bony ridge (the original circumference) remains. In time the ridge likewise disappears, resembling in this respect callus around a fractured long bone. Three to four months from the outset no trace of thickening can be appreciated.

Exceptionally the entire mass undergoes a process of ossification. Three such cases have come under my ob-

servation. Two of these were seen in the service of Professor Jacobi at the Children's Clinic, College of Physicians and Surgeons; the third was a case in private practice.

Willie B., first child, born after a tedious labor of twenty-five hours. Upon the subsidence of the caput succedaneum, an elastic swelling was noticed over the right parietal bone. The mother was advised to have this opened by the attending physician, but wisely objected. The case first came under my observation when the child was five weeks old. It then presented the usual features of a subperiosteal cephalhæmatoma with a distinct bony ring at its circumference. Two weeks later, ossification had increased to such an extent that but a small fluctuating spot, not larger than the diameter of a five-cent piece remained at the most prominent portion of the swelling. In another week this, too, became firm and hard.

At the age of twelve weeks, I found a firm, bony swelling at the posterior and upper parts of right parietal bone, the most prominent portion being over one-half inch above the normal level of the head. The mass appeared to be solid; firm pressure did not show any yielding or soft spot in the surface.

When six months old the tumor did not seem to have diminished any in size. Since writing the above, a fourth, but much more unusual case, came under my observation. An extremely rachitic child, two years old, instrumental delivery, presented two ossified tumors of this description upon either side of the frontal bone. Their characteristics were such, that they could not be confounded with the rachitic osteoid prominence so common in rachitis.

The production of bone in the peripheral portions of this class of tumors admits of ready explanation. The bones forming the vault of the skull, the parietal, frontal and a certain portion of the occipital are developed in membrane or fibrous tissue.

The membrane, afterwards forming the periosteum from which such bone as the parietal is developed, consists of two layers—an external fibrous and internal cellular or osteo-genetic. If a thin metal plate be placed beneath the periosteum of a growing bone it will soon be

covered by osseous deposit, but if it be put between the fibrous and osteo-genetic layers, it will never become enveloped in bone, for all the bone is formed beneath the latter. (Kirke's Physiology.) Thus, when the periosteum which forms the limiting membrane of the subperiosteal form of cephalhæmatoma is separated from the bone itself by extravasated blood, its power to produce bone is not destroyed. Ordinarily a hard ridge forms at the outer periphery of the mass. In rare instances a large bony crater is produced, and in other cases the walls may be more or less extensively ossified; finally the entire mass may be transformed into bone. Remge reports three interesting autopsies. In the first, the bony ridge was well developed at the eighth day. In the third case, though the infant died at the sixteenth day after birth, from other causes, a hard bony wall roofed in the circumference of the swelling.

A most remarkable case has been reported by Bland Sutton. A monkey in the "Zoo" had on its head a large rounded tumor, which was soft and fluctuating at the top, where a feeble pulsation was perceptible. That portion near the skull was extremely hard and felt like bone. At the autopsy the tumor was found to be an old cephalhæmatoma with extensive ossification on its walls; the crater-like arrangement of bone on the top of the skull was covered in by pericranium, and contained dark fluid blood. The frontal bone forming the floor of the cavity was so thin that it yielded to pressure of the finger like parchment. Some of the ossicles forming the walls of the cyst were bevelled at the edges and serrated, so as to articulate one with the other like Warman's bones. Fragments of these bones were examined microscopically and found to exhibit the structure of true bone.

DR. S. TYNBERG'S PYGOPAGUS.

BY A. JACOBI, M.D.,

New York.

Two female children were born April 15th, 1895, in 342 East Forty-second street, New York, in the presence of Dr. Sigmund Tynberg, with whose name the newcomers ought to be handed down to posterity. Confinement was easy, the head of one fœtus being soon followed by the lower extremities of the other, and the rest of the joined Twins. The placenta was single, also the cord which divided into two branches two inches from its velamentous insertion. The twins are united below the third sacral vertebra, the sacra are united on one side, so that the babies can lie almost alongside each other; and one side, or posture, may be called front, the other back. The diameter of the juncture is about one and one-half inches. The backs of the children are straight, the upper sacral vertebræ are distinct, the lower and the coccyx are single. From one side (the anterior) the finger presses in to a great distance; not so on the opposite side. On the former the tubera ischii are very marked. There are two vaginæ, two clitorides, two urethræ, (the children do not micturate simultaneously), four labia minora, but only two majora which surround the two sets of genital organs.

There is one anus, but the rectum is double, has at least a septum; two silver probes introduced do not touch each other. The babies begin their efforts to defecate simultaneously.

Tickling on the soles of the feet of one produces no effect on the other child. They live a separate life. One cries in the night and sleeps in the daytime, the other follows opposite rules. The mother looks pale and worn in proportion.

Pulse in one fœtus 122, in the other 126, both in the upper and lower extremities. Both babies are thriving.

In the following I shall give a brief outline of the history of pygopagus, which will show that Dr. S. Tynberg's case is the fourteenth on record.

Amb. Paré (*Opera Paris*, 1582, p. 734) has two cases:

CASE I.—Two girls were born 1475, at Verona, "sibi dorso ab imis humeris et nates usque arctissime cohaerentes."

CASE II.—"Anno dom. 1486, ad Hildebergam in Agri Palatini pago Robarchio (Rohrback, near Heidelberg), gemelli duo nati sunt dorsibus cohaerentes et hermaphroditi ambo." (Males with a high degree of hypospadias.)

In both cases a fair part of the vertebral columns, besides the sacra, appear to have been in common. The latter case is also mentioned by Licetus, de Monstris, Amst., 1665, p. 80.

CASE III.—Treyling's case is found in *Acta Phys.-Medica Acad. Cæsareæ Leopoldino-Carolinæ.*, *Nat. curios. exhibentia Ephemerides*, Tome v. *observ.*, 133, p. 445.

"Gemellæ mediantibus ossibus coccygis sibi invicem connatæ" were born 1700, in Kolndorf, Krain, Austria. A Vienna surgeon tried to separate them with a medicinal caustic. The girls lived but four months. Every organ was normal but the coccyx, which was common to both. The rectum was double, but the anus single.

CASE IV.—Helena and Judith, the Hungarian girls, were born Oct. 26th, 1701, and died when twenty-two years old (Torkos in *Philos. Trans.*, vol. 50, part i, 1757, p. 311; *Werther disputatio med. de monstro Hung.* Lips, 1707. Joh. Mich. *Eccardus Diss. Kiliae*, 1709. Geoffroy St. Hilaire.

They could walk forwards and backwards, but slowly. Anus was common, it lay between the right thigh of one and the left of the other. Vulva was single.

Defecation was simultaneous, micturition was not. Judith became hemiplegic and had convulsions, also hysterical attacks. Helena never suffered. One had pertussis, the other was spared. Menstruations differed in time, amount, and symptoms. Judith was taken sick,

and both died after a fortnight, Helena having a slight fever and frequent coma. The iliac arteries and veins communicated in the pelvis.

The sacra combined from the second vertebræ downwards. Vulva and anus in common. Urethra single.

CASE V.—C. F. Wolff in *Acta Acad. Scientiarum Petropol. pro anno* 1778. P. i, p. 41.

Twer, Russia, 1778. Children (sex not mentioned) lived two months.

Half of the pelves were united, from upper margin to coccyx. Anus was in common. No other data.

CASE VI.—Barkow (*Monstra animalium duplicia per anatomen indagat.*, Lips., 1828) describes two female fœtuses born at full term.

Perineum is common. There are two anuses separated by a septum. Three labia majora; four minora, two of which were larger (the posterior ones), two smaller. Each fœtus has a large and a small one. Vaginæ are separated by a septum. There are two urethræ and two cords. The sacrum is single below the first vertebræ; instead of the bone below, there is but a strong ligament. One fœtus had a large diaphragmatic hernia. Each had but one kidney. One had but one umbilical artery. The two cords were combined in the sacral canal. No nerves, however, originated in this combined part.

CASE VII.—Normand (*Bull. de la Faculte de Medecine de Paris*, 1818, No. 1) reports his "Observation sur deux jumeaux accolés dos à dos."

A woman of thirty years had two children previously. The pygopagus had four nates, one large scrotum, four testicles, one penis, one anus, one urethra, one placenta, and one cord, with two branches.

Meckel (*Müller's Arch.*, 1850) says that two cords have been observed only in fourteen cases of parietal and frontal adhesion, and in the Hungarian sisters. Also in the cases of Barkow, and Licetus (Amb. Paré). One of the (male) children was one and one-half inches longer than the other. Extremities, however, were equal. They died on the ninth day.

CASE VIII.—Molitor (*Beob. u. Abh. aus d. Gebiete d. ges. prakt. Heilk. v. oesterreich. ärzten*, 5, Wien, 1826) reports a female pygopagus.

There were one placenta, one cord, with two branches; one anus, one urethra. The infants were joined from last lumbar vertebræ to coccyx, and partial union existed between the ossa ilium. The twins were of unequal size, lived twenty-five days, and died in convulsions. No autopsy.

CASE IX.—Chrissie and Millie, born in North Carolina, in 1851.

One of the earliest descriptions is that by Ramsbotham. The children were then five years old. The union had a circumference of sixteen inches, and extended from below the first sacral vertebræ to the coccyx. There is union of the right half of the sacrum of one, and the left of the other infant. There are four tubera, one anus below the coccyx, one blind depression laterally. The single rectum is large, no septum within reach. There are two clitorides, two hymens, two vaginæ, two urethræ. Only two labia majora. The symphyses are distinctly separated. The genital organs are at some distance from each other.

The children can kiss each other; one rests on her back, while the other is on her side. They walk well, but not alongside each other. One may be awake when the other sleeps. They are hungry at different times. Pulse is not synchronous. Purgatives take effect only on one. Menstruation is synchronous. Defecation is synchronous, but Münter reports that they can hold their feces separately.

(Virchow in *Berl. Klin. Woch.*, 1873, No. 9. Tardieu *Bull. de l'Acad. de Med.*, 2 Serie, Tome III., *Seance* 20th, 1874.)

On the union there is a zone of some centimetres with common sensations. If one be touched, a sensation of something going on is felt by the other girl, but no localization is possible. While the radial pulse is not synchronous, the pulse of the arteries of the feet is, which proves a union of the aorta in the pelvis before branches are given off to the lower extremities.

CASE X.—Joly and Peyrat (*Bull. de l'Acad. de Med.*, 2 Serie, Tome III.) relate the female pygopagus born in January, 1869, in Mazères, France; one died after ten hours, the other after twenty.

One of them had a spina bifida. There were two cords and two placentæ, one vulva, one vagina, clitoris, hymen, urethra, anus. The connection of the two bodies reached probably from the first or second sacral vertebræ downwards.

CASE XI.—The Bohemian sisters, Rosalia and Josefa Blazek, born January 20th, 1878, were still exhibited in Vienna about the latter part of 1892. Breisky, in Prague, and Marchand, of Breslau (*Br. ärztl. Zeitsch.*, 1881, No. 10) furnished descriptions. Their mother was twenty-two years old, and had a female child before.

The faces are turned to one side so that there is a virtual front and back. The girls are well developed, both physically and mentally. Very careful examinations were never permitted. The pelves are connected throughout the sacra. There are two gluteal regions. Probably the two spinæ posteriores of the ossa ilium are amalgamated. There is one set of labia majora, but two vaginæ; urethra is single, but vulva appears more triangular. The skulls are asymmetrical.

CASE XII.—Two female fœtuses of the ninth month are described in a pamphlet by Friedrich Adolph, of Frankfort-on-the-Main.

Placenta single; cord single up to twenty-four cm., then two branches are given off of forty-five and fifty cm. in length. Total weight of the two fœtuses 4380.0 grammes. They are turned to one side so that it is possible to speak of front and back. There are slight differences in the lengths of the several extremities.

Head asymmetrical. One of them has a large encephalocele of the occiput. Labia majora in common. Sacrum is common from the second vertebræ downwards. Coccyx is single.

The right os ilium of one fœtus and the left of the other are connected, by cartilage above, by fibrous material below, so there is a common incisura ischiadica.

The anatomical appearance at the autopsy is such that there probably was no adhesion and conglutination, but a primary formation of but a single sacrum and coccyx.

The sacs of the spinal dura mater of both fœtuses connect above the sacrum, and are single in the canalis sacralis. Inside there is but one cord.

In one fœtus the left umbilical artery did not come from the hypogastric, but directly from the aorta. The lower part of vena cava was double (through persistency of the vena cardinalis). As fœtus No. one had but one hypogastric artery, the right being absent, so fœtus No. two was without the left. Instead of them there was a large communicating vessel. Fœtus two had no umbilical vein. Thus circulation was, similarly to that in the acardiacus, established through the liver of one fœtus. Vulva in common, triangular. Labia minora united. One præputium and frenulum clitoridis. Clitoris not well developed. Two vaginæ; two hymena; two urethræ; two bladders; two uteri. One of the four kidneys is low down in the pelvis. Recta are double, but united immediately above the anus.

CASE XIII.—Marchand (*Beitr. z. pathol. Anat. u. allg. Pathol.*, xvii., p. 1, 1895. Quoted in *Schmidt's Jahrb.*, 1895, No. 6) reports a female pygopagus born dead in the eighth lunar month, after version and difficult extraction, the heads, however, following with facility the extraction of the four upper extremities.

The mother had three previous confinements and one (four months) miscarriage. Union takes place in lower dorsal and pelvic region. The two fœtuses are turned to one side so as to present a common quasi anterior aspect. Fœtus one (left) is forty-seven cm. long, fœtus two (right) forty cm., and has a large occipital encephalocele. Their common weight is 4380 grammes.

There is a common placenta, 650 grammes, of a size twenty-three by eighteen cm. Cord is very thick, its insertion somewhat lateral, single to a distance of twenty-four cm., double afterwards. A branch of forty-five cm. supplies the smaller fœtus, the other of fifty cm., the larger one. Each of these branches has but two blood vessels, one artery and one vein. The two arteries join into one just before the insertion of the cord in the placenta. The coccyx and the larger portion of the sacrum, up to the second sacral vertebræ, are common to both fœtuses. There is union between the sacra, and the left os ilium of fœtus one and the right of fœtus two. The two other ossa ilium are moveably united at their posterior

margins. This union is cartilaginous above, fibrous below. The lower part of the spinal dura mater is common. The lower part of the cord of fœtus one is arched and joins the smaller one of fœtus two, in this way it enters the sacral canal and forms the filum terminale. There is no actual cauda equina. The two sympathetic nerves join in the pelvis, at the juncture of the vertebral bodies, thus there is a common sympathetic innervation of the pelvic organs. There is a similar union of the vascular systems. The right termination of the aorta of fœtus one does not form an umbilical artery, but runs into the left terminal branch of the aorta of fœtus two. In the same way there is a direct connection between the two cardinal veins of both fœtus one and two. The two recta join below and have but one anal aperture, but a small incomplete fistula at the anterior margin of the united anterior labia suggests a second anus. Urinary and sexual organs are double, only the vestibule is single.

Autopsy on Dr. Tynberg's case, made under the supervision of Prof. H. Biggs:

The children died on September 11th, 1895, the left child dying eight hours before the right.

Left child.—The abdominal cavity was considerably distended, post-mortem discoloration being more marked than in the right. Both children were markedly emaciated, with considerable abrasions around the external genitals. The length of the left child was 48 centimetres; that of the right 50 centimetres. The large intestines, especially the transverse colon, were found markedly distended. From three to four drachms of clear, straw-colored fluid escaped from the abdominal cavity. The mesentery of the transverse colon was relatively very long. The liver extended slightly below free border of ribs and occupied whole of concavity of diaphragm of both sides, the larger mass being on the left side; the suspensory and round ligament were situated about one centimetre to left of median line and extended to right and upward of diaphragm. The diaphragm was in the fifth intercostal space of right, and sixth of left side. The stomach lay beneath and in front of the large left lobe. It was very small. The mesentery of calcum was unusually long and free and the sigmoid flexure large. Abdominal organs were otherwise normal in position and character. Uterus, ovaries, bladder and rectum appeared normal from abdominal aspect.

Right child.—Stomach and liver normal. Large intestine somewhat distended; omentum long; liver extend-

ing to free border of ribs. Stomach markedly greater than in left child. Pelvic organs normal in position and character. Between the pelvic cavities there was only fascia and peritoneum; the lower ends of dura mater spinalis communicated, both being very much dilated; the spinal cords *not* fused. The bond of union was at lateral masses of sacrum, the latter being unusually developed. It was ligamentous and cartilagenous in character and easily cut through. Dura mater sacs communicated through a space corresponding to the opening in the sacral canal. External genitals could be separated without injury to either.

Each child had its own complete generative organs, and each its distinct circulatory apparatus. The anus was common to both, but was largely situated in the right child. About one-half centimetre above the anus was a well-developed antero-posterior septum, also more closely identified with the right child, and thick enough to form a perfectly normal rectum for each. The cords did not communicate. The cord of the left child was normal; that of the right extended into the sacral canal.

THREE CASES OF PURULENT OTITIS MEDIA

BY WILLIAM F. LOCKWOOD, M.D.,

Baltimore.

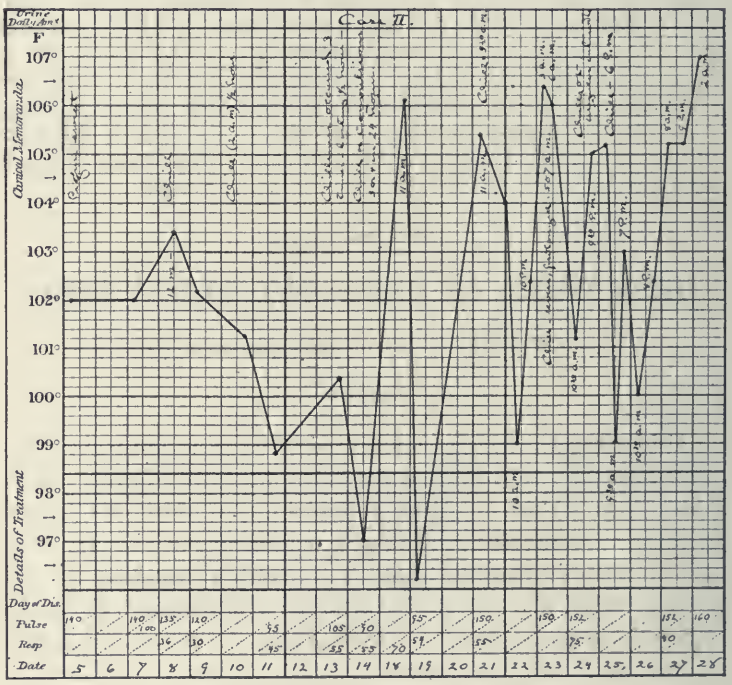
According to the diagnosis made in the three cases herein alluded to, each represented a somewhat different condition, but all proved alike perplexing, and progressed to a fatal termination. Middle ear disease caused in one *meningitis*, in another meningitis with *thrombosis of the lateral sinus*, and in the third *ulcerative endocarditis*, with thrombosis and *general septic infection*. Their history and course are briefly as follows:

CASE I.—C. S., white, age nineteen months, was first visited on January 21st, 1892. There had been no previous sickness, except a slight bronchitis some weeks before, and a discharge from the right ear, which had lasted three weeks. This was profuse and rather offensive, but was apparently controlled by local treatment. A few days later, there were fever, violent pain in the region of the ear, rolling of the head, rigidity of the neck muscles, half

closed lids, dullness, coma, and death on January 28th, one week from the time of the first visit.

There had been no marked vomiting, but an unusual flow of saliva at the beginning of the serious symptoms; no mastoid swelling; no swelling about the neck.

CASE II.—M. O'B., white, female, aged nineteen years, had occasional discharge from left ear since childhood, but was otherwise well until May 29th, when earache began and continued until June 5th. There was during this time violent frontal and occipital headache, the pain extending



along the cervical spine, vomiting for three days, and a chill every morning about six o'clock, described by her mother as "nervous."

At the time of the first visit, the temperature was 102° F., the pulse 140. There was profuse sweating. The tongue was coated—brownish in centre. Her manner was nervous and expression anxious. She complained of giddiness: there was no tenderness about the ear, and no

discharge. A diagnosis of meningitis was made (or possibly typhoid fever).

6th. Discharge from left ear; vomiting frequent; headache less.

7th. Headache, delirium at night; vomiting whatever is taken; stiffness of neck muscles and disinclination to move them; sweating.

8th. Chill shortly before visit at 12 M.; tremulousness, pain in back; less headache; slight cough. (For temperature record see chart.)

9th. Nose bled a few drops this morning; four loose actions in the twenty-four hours; ear discharging freely a watery, offensive fluid.

10th. Has vomited once only and craves food; chill at 2 A.M., with no sweat; headache less; no discharge; apparently slight strabismus.

11th. Stiffness of neck and back; wakeful at night; vomited once; no tympanites or abdominal tenderness.

13th. Vomited twice; three loose actions, accompanied by chilliness; pain in ear, with swelling and soreness of neck on corresponding side; no discharge.

14th. Restless at night; slept three hours this morning; looks and feels better; neck swollen and tender, without heat or redness; no vomiting. The later "chills" seem to have been convulsions—rigidity of extremities alternating with general muscular twitchings; screams at beginning of chill, and drops off to sleep afterwards.

From 14th to 18th, occasional pain in ear and head; no discharge; temperature variable, reached 105° F. once in the evening.

18th. Headache; has vomited everything taken since morning.

19th. Passed a better night; slight nose bleed; no headache or pain.

21st. Chill at 5.30 A.M.; several loose actions; vomiting frequent and constant thirst; has pain in left side; no pericardial or pleural sound; no effusion; slight pain in ear.

22d. Bright, and claims to be feeling better.

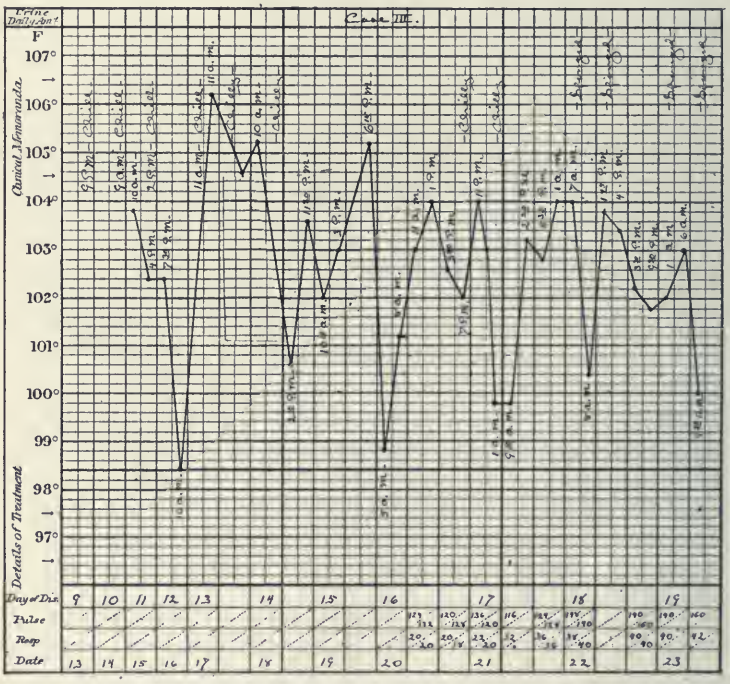
23d. Has had several chills, one prolonged and severe; is delirious, and kept in bed with difficulty, vomiting frequent.

24th. Mind wandering; sleeping most of the day; in absence of attendant, walked into the adjoining room; several stools, not loose, but very dark; chills at irregular intervals; feet are swollen, particularly the left.

25th. Chill about 6 P.M.; nose bled during forenoon; retains whiskey and nourishment; expresses anxiety about her condition.

28th, 2 A.M. Temperature 107° F.; pulse 160; (intermittent); pain in swelling on side of neck. Died at 6 A.M.

CASE III.—A. B., aged fifteen years, had a chronic discharge from the left ear and slight deafness, following scarlet fever, at the age of six years. A chronic endocarditis, with hypertrophy, dated from the same illness, but had caused no serious inconvenience. There had been occasional attacks of earache, accompanied by increase of the discharge, which had usually yielded promptly to domestic remedies. He was treated for adenoids of the



naso-pharynx and enlarged tonsils, in the Spring of 1894, with apparent benefit to his general health.

November 28th, 1894, an attack of earache occurred, was relieved, and he returned to school on December 3d and 4th. Two days later, there was a return of the earache, and he was visited for the first time December 7th.

At that time there was fever and pain in the ear. No other local symptoms, except free aural discharge. These subsided in a few days, and did not return, though the temperature varied slightly and continued a little above normal.

December 13th, there was a chill with decided rise of fever, and from that time the course of the illness was typical of general septic infection, starting from an acute endocarditis engrafted upon the already diseased aortic valves, and leading to infarctions of the spleen and other organs.

The accompanying chart shows plainly enough the character of the case, and further details are omitted, except to quote from the autopsy notes furnished by Dr. Flexner, as follows:

"The cultures made at the time of the autopsy from the muco-pus in the middle ear and from the pus in the peritoneal cavity gave a growth of pure streptococci. * * * Cultures were made from the vegetations on the aortic valve, from the liver, infarctions in the spleen and kidneys and from the lungs. In *all* instances, a growth of pure streptococci was obtained.

"Cover slip preparations made from the thrombus on the aortic valve gave a colossal number of streptococci, and no other organism could be detected upon them or in the cultures. Cover slips from the spleen and kidney also showed only streptococci, but they were not so numerous in these preparations as in those from the thrombus mass.

"The case becomes therefore quite clear; the suppurative otitis media doubtless was the primary disease, and in this connection I would like to say that the medullary portion of the petrous portion of the temporal bone looked infiltrated, although until I have completed the microscopical examination, I should not like to commit myself finally on that point.

"From this point out, the infection of the aortic valve (already the seat of a chronic endocarditis) took place, then septic emboli were carried hence to the spleen, giving rise to a large infected infarction, which, extending to the capsule, infected the peritoneal cavity, causing a general peritonitis, and others carried to the renal artery caused septic infarctions of the kidney. Finally a general infection of the body with streptococci took place.

"The anatomical diagnosis is as follows:

"Suppurative otitis media (due to streptococcus pyogenes).

"Chronic endocarditis of aortic valve, heart hypertrophy.

"Acute ulcerative endocarditis of aortic valve (due to the streptococcus pyogenes).

"Septic infarctions of the spleen, followed by acute general fibrino-purulent peritonitis.

"Septic infarctions of the kidneys.

"General infection with streptococci."

I have made a short report of these three cases, not that they are unusual, but because they are repeatedly met with, and because the general practitioner is peculiarly helpless in dealing with them. While a large majority of the cases of acute otitis media with perforation heal promptly, Case No. 1 serves to show that the condition is serious enough to demand painstaking care. Case No. II exemplifies the danger, which may result from a *long standing* aural discharge. I have gone over this case in detail to illustrate the difficulties which may be encountered in making the diagnosis accurate enough to justify operation. The suggestive symptom in this connection was the swelling in the jugular region pointing to thrombosis of the lateral sinus. However, an aural surgeon and also a general surgeon, who saw the case in consultation, did not advise surgical interference.

The third case, the only one in which an autopsy was obtained, shows the peculiar danger to which a patient may be exposed, who, with a chronic aural discharge, has also diseased heart valves. The post-mortem examination in this case showed conclusively that from the time of the first chill no operation whatever would have availed to save the life of the patient.

Dr. Gorham Bacon, of New York, reports one case of pyemia following acute suppurative otitis (*Trans. Amer. Otological Society*, Vol. iii., Part iv.) in a young man, aged twenty-three, who recovered. Zaufal (of Prague) has shown that the presence of streptococcus pyogenes in the secretions from an inflamed middle ear is of great importance in regard to prognosis, since it has been frequently

noticed in the very serious cases of middle-ear inflammation. ("Burnett's System of Diseases of the Ear," 1893.)

Without presuming to cross the line which separates the general practitioner from the specialist, it seems proper for me to say, as a result of my limited experience and observation, that in the matter of treatment, cases of chronic otitis media receive, as a rule, less careful attention than they should.

Inflation, cleansing, antiseptic powders and fluids are all recommended, but are not as thoroughly applied, in general practice, as might be. The conduct of the case is too often left to nurses or parents, and dirty syringes and instruments have doubtless contributed their share of fatal cases.

As in other maladies which occupy the border land between the domains of medicine and surgery, the careful physician will do well when danger threatens to seek early an ally in the surgeon.

DISCUSSION.

Dr. Caillé inquired if there were any symptoms of localized abscess anywhere, to which Dr. Lockwood replied that there were not.

Dr. Caillé said that he wished to draw attention to the new method of making a diagnosis between meningitis and localized abscess by tapping the vertebral canal. In cases of meningitis, the cerebro-spinal fluid would be found turbid, while in abscess it was usually clear.

AMNESIC APHASIA—SCARLATINA ANGINOSA PNEUMONIA CROUPOSA.

BY SAMUEL S. ADAMS, M.D.,

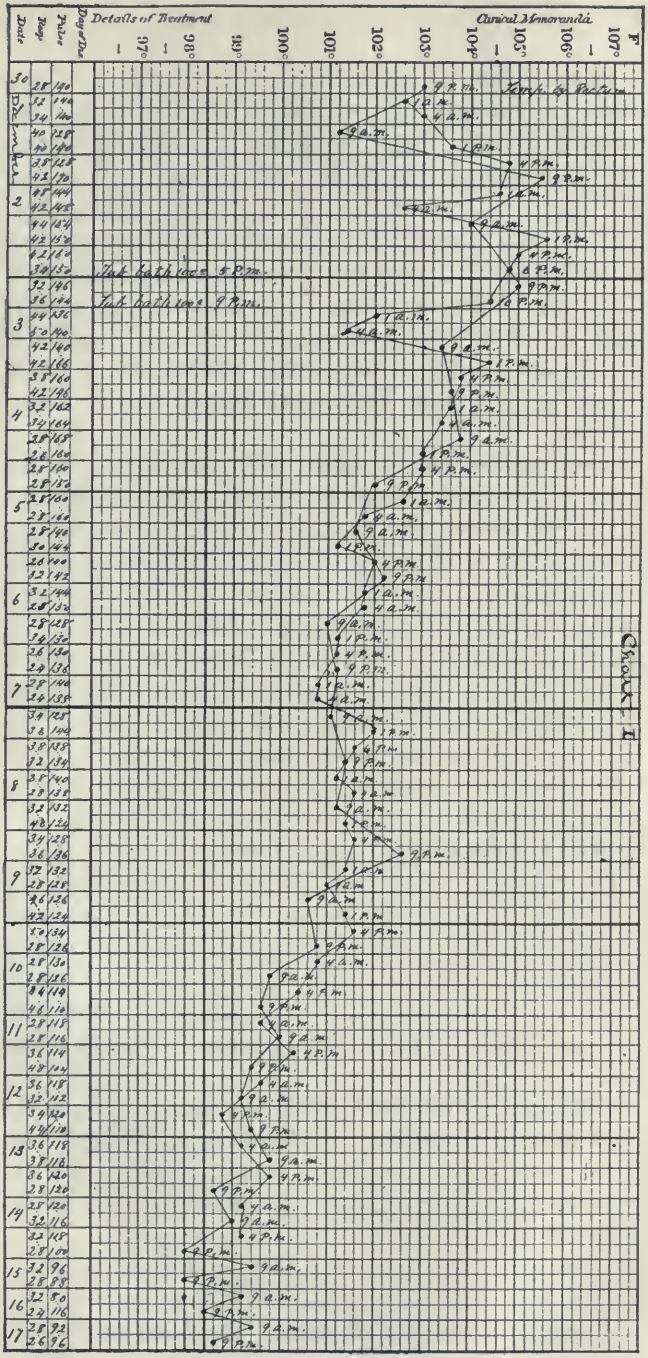
Washington, D. C.

Jesse S., male, mulatto, aged three years, was admitted to the Children's Hospital, D. C., October 9, 1894.

His family history does not point to any hereditary disease, and he never had any of the diseases of infancy. Yesterday he fell from a porch to the ground—a distance of twenty feet—striking the top of his head, which rendered him unconscious for twenty minutes. Nothing developed until night, when he vomited blood seven or eight times. Prior to the accident, he talked rather better than a child of his age, and walked, romped, and ran as well as could have been expected.

Present Condition.—His expression is vacant, there is no irregularity of the pupils, and he cannot, or will not, talk or answer questions. There is neither contusion nor abrasion of the scalp, nor anything about the body to indicate the point receiving the blow. He suffers if the right shoulder is manipulated. He is unable to stand or bear any weight upon his legs, but voluntary and reflex movements are normal, and the facial muscles are all right.

October 15th, patient transferred from the surgical ward to my service. There has been no improvement since his admission, and his condition is as described above. He has not vomited since he entered. A slight right facial paralysis is detected only when he smiles. A careful physical examination again fails to reveal any external injury. He can move his legs at will, and the reflexes are normal, but he cannot stand alone. There is no tenderness over the spine. He cries out at times as if from fright. The pulse, respiration, and temperature have remained normal. Every word or question put to him is repeated with astonishing rapidity and precision,


Details of Treatment
Curves Memoranda
Day of Disease
Date
Temp.
Pulse
Temp. & Pulse in
Tak bath 10 a 8 P.M.
Tak bath 10 a 9 P.M.
CHART II

and there is no difficulty in articulation, but he seems conscious of the fact that his answer is not what is wanted, because he smiles when he gives it, although he never attempts to correct the error. For instance, to the question, "Is your name Billy Buster?" he begins his response almost simultaneously with the utterance of the last word, and with the same speed, modulation, and intonation says: "Is your name Billy Buster?" Just so with "Who is this?" "Have some ice cream?" and many other similar phrases. Repeated efforts fail to elicit an accurate reply. The house staff and nurses in like manner failed.

November 8th, his general health has improved and he seldom cries out, as previously noted. His mind is clear, but he still repeats all questions promptly and distinctly, without giving an intelligent answer. The facial paralysis has disappeared. He loses his equilibrium if he attempts to stand alone without holding to some object.

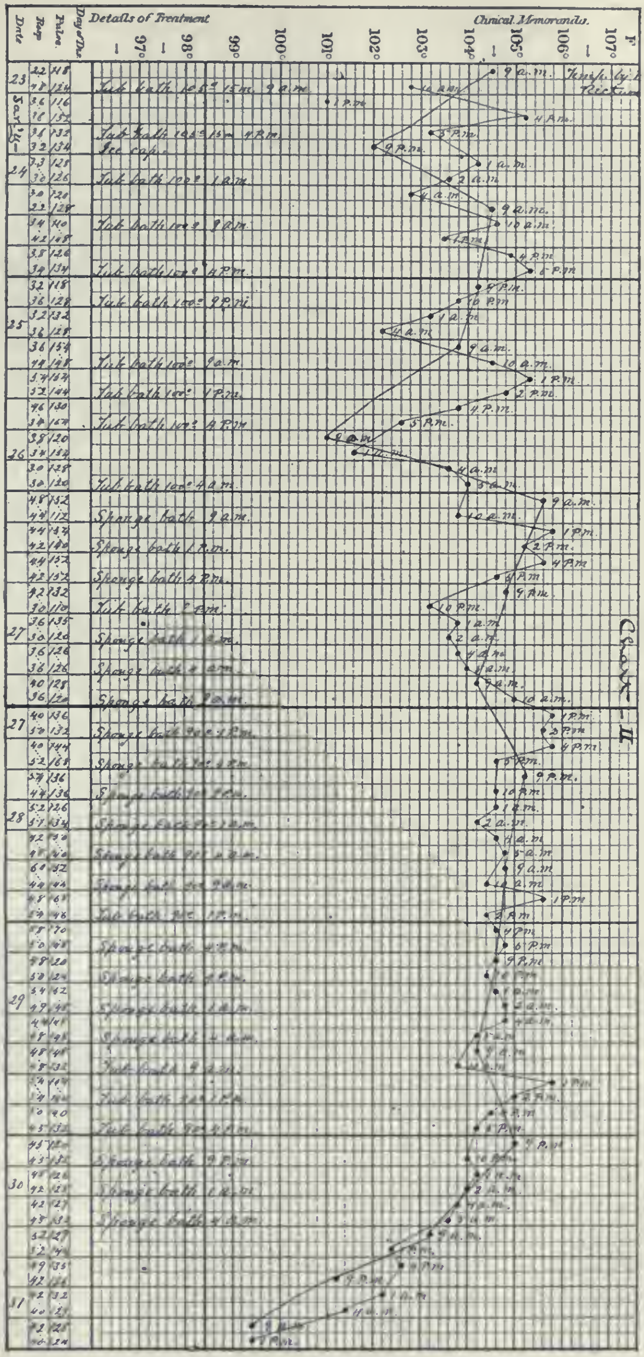
Although, as we have seen, it has been impossible to find any external wound, nevertheless there was certainly every indication of an intra-cranial lesion.

He was kept under observation from this time, and efforts were made at each of my visits to detect any signs of improvement.

Scarlatina Anginosa.—November 30, 1894, no material change had been noticed in his condition until last night, when he was taken with nausea, vomiting, and high fever. This morning, the tonsils, palate, and pharynx are highly congested, and there is a scarlet rash over the anterior part of his chest. At my visit, I diagnosticated scarlet fever, and had him immediately removed to the *isolating ward.*

December 1.—Vomited twice during the day, and was very restless: dyspnœa. Temperature, 105.5°. Rash marked on the chest and inner side of thighs. Given hot mustard bath and three grains of phenacetin in six doses. (See Chart 1.)

December 2.—Throat very sore, and deglutition difficult. Characteristic eruption diffused over body, being very intense on palms and soles. Restless, nervous, and



Date
Resp
Pulse
Day of Dis.
Details of Treatment
Clinical Memoranda
97° 98° 99° 100° 101° 102° 103° 104° 105° 106° 107° F
Chart – II

breathing stertorously. No lung complication. Urine normal. Convulsions at 5 P.M., when he was placed in a bath at 100° F. for ten minutes; a second convulsion at 9 P.M., and the same treatment was given. As he vomited a round worm during the day, he was given fluid extract of senna and spigelia.

December 3.—Nervous symptoms not so marked as yesterday. Breathing easier. Urine normal. Appetite better. Drowsy most of the day. No twitchings.

December 4.—Eruption continues about the same. Restless, and tossed about as if in pain. Lies in a stupor, with teeth clinched. Later in the day he showed more signs of consciousness.

At 7 P.M., not having passed urine for twelve hours, hot fomentations were applied to the hypogastrium for an hour without benefit. Four ounces of normal urine were drawn by catheter. In eight hours, was again catheterized, and two and one-half ounces of normal urine were withdrawn. Poultices were now applied over the kidneys.

December 5.—Rash now becoming paler; cries out as if in pain; mind clear; talks a little. It is to be noted that this is the first time he has spoken, except parrot-like, since his admission. He voided urine, or was catheterized during the day, and seventeen ounces of normal urine were passed during twenty-four hours.

December 6.—From this time, convalescence was undisturbed; desquamation was profuse, and he was returned to the general ward January 10, 1895.

Pneumonia Crouposa.—January 23, 1895—Patient has gotten along well until this morning, when he had a severe general convulsion at 8 o'clock. Pulse, 118; respiration: 22; temperature, 104.5° F. Hot-water bath given. Had two more convulsions, for which baths were given. He seemed so nervous that an ice cap was applied to head.

January 24.—Had a comfortable night. Abdomen greatly distended, and tender to touch. Respirations are rapid, but a careful examination fails to discover any intra-thoracic disease.

January 25.—Abdomen very much distended, and he

cries out if attempts are made to straighten his legs. Turpentine stupes ordered.

The signs of croupous pneumonia appeared, and the crisis occurred January 30th, the ninth day. The entire right lung was involved. The treatment consisted of stimulants and cold externally.

It seems rather remarkable that a child three years old should be able to pass through two diseases and recover so quickly while still carrying a crippled brain.

February 10.—He talks rationally, but repeats at times. He now asks for food.

February 20.—Talks better, and seldom repeats. Walks, but loses his balance frequently.

April 7.—Discharged cured.

1 DUPONT CIRCLE.

A DISCUSSION ON THE CHARACTERISTIC FEATURES OF THE RECENT EPIDEMIC OF GRIPPE, 1894-1895.

Dr. L. Emmett Holt: The cases I shall speak of began with symptoms of great severity, the temperature running very high during the first twenty-four hours, being in one case 107.4°; in the other, 106.8; and the cerebral symptoms being intense. The first patient was a baby five months old, previously healthy, artificially fed. When first seen, the temperature was 104°. Fine râles could be heard throughout the right lung. In a few hours, the temperature had risen to 106.8°, and there was spasmodic twitching of the muscles. A cold bath was given, and the temperature fell to normal and did not rise again, the patient going on to perfect recovery.

The second patient was a baby of four months, and was perfectly well up to the time of the attack. It was taken in the afternoon with convulsions, which were repeated in the early evening and again at midnight. The temperature then was 107.4°, and the child was almost in *extremis*. Cold baths brought the temperature down to normal, but it immediately rose again to 105°. Baths were then given at intervals of a few hours, and temperature remained at

101°. The earliest physical signs in the chest were those of commencing pneumonia, but the signs entirely cleared up at the end of thirty-six hours. The temperature remained at 101° for four days; on the fifth day, convulsions came on again, and the temperature went to 106°, and from that time it ran the typical course of pneumonia. The crisis came after six days, and the case went on to convalescence. This child was kept alive for three weeks by gavage, four ounces of food being given at intervals of four hours. It was regurgitated only once or twice. A third attack came on, but without convulsions, and lasted only two or three days. The child made a perfect recovery. The interesting features about these cases were the high temperature, the intense cerebral symptoms, and the resemblance to pneumonia.

Dr. J. P. Crozer Griffith: The following cases illustrate the multiform character which influenza may take in children. The adults were unmistakable cases of the disease. The children would hardly have been considered so were it not for the fact that they partook in a distant house-epidemic affection—seven individuals in all. There was no sudden change in the weather or other cause to which the illness could be attributed:

Grippe in the family of Mrs. C. F.—1. C. F., aged seven years, on night of March 4th had high fever and ached through the body; there was a slight sore throat; the eyes were red. In the morning of the 5th, he was still very hot, but made no complaint. His throat was slightly red, and he had some cough.

2. Susan D., nurse, March 6th, 1895, was attacked by severe headache and general and quite characteristic aching, with considerable prostration. She was better on the 7th, under antipyrine and quinine, but the aching returned on the 8th, after the medicine was stopped, and it was renewed.

3. Joanna W., nurse, March 6th, 1895, in the afternoon, was attacked by intense aching all over the body, including the head. This lasted through the night, and until the morning of the 7th, when the face was much flushed,

but there was no elevation of temperature. There was no sore throat. There was slight cough; the flesh was tender, but there was no involvement of the joints. Antipyrine and salol were given. By the 8th, she was much better, but felt weak; on the 9th, the aching was entirely gone, but she was still weak.

4. Margaret F., fourteen months old, on March 7th, was feverish and cross through the night. The throat was swollen and red. Examination of the lungs was negative. 8th, voice croupy when she cries. Râles heard in the chest. 9th, much better. 11th, has a cold in the head.

5. Bertha W., nurse, March 7th, ached all over, and felt scarcely able to be about. Better on the 8th, but not well.

6. Natalie F., nine years, on March 7th, croupy; on the 9th and 10th, still croupy.

7. Caleb F., three and one-half years, on March 10th, grew very croupy in night; was oppressed all day on the 10th until evening; was better in the night, but the voice was still hoarse on the 11th.

Dr. J. Henry Fruitnight: I wish to speak of the aural complications. Some of my cases developed intense congestion of the throat, with extension to the ear by the Eustachian tube. The attacks would begin with high temperatures and pain in the ear; the drum would be intensely injected, and in about twelve hours there would be a discharge of blood from the ear. Soon there would be amelioration of the pain; deafness would last for a short time only, and in three weeks the hearing would be normal.

Dr. John Dorning: I wish to present a temperature chart of an unusual case. A child twenty months old was taken ill on the 27th of April with a temperature of 106°, and I suspected pneumonia, although the physical signs were not clear. On the second day, the temperature fell. On the fifth day, had a marked remission. On the third day, there were evidences of beginning consolidation on the right side posteriorly. On the fifteenth

day, a decided crisis occurred, but on the sixteenth there was an exacerbation, another followed on the nineteenth by a crisis. Again the temperature went up, and on the twenty-third day a final crisis occurred. The child about the fifth day seemed to show a little uneasiness on the right side of the head, and examination showed acute otitis media. The drum ruptured and a discharge followed. Four days later, the other ear discharged without any preceding pain. The most interesting feature was the action of the temperature. For some days I used the cold pack, and the temperature would fall three or four degrees, but finally its greatest effect was a reduction of only one and a half degrees. I then tried sprinkling, which acted favorably for a time, but I was finally obliged to use the ice pack to the radial arteries.

Dr. F. Gordon Morrill: Dr. Blackader spoke in his remarks of a preparatory crisis, as it were. I think that is a common feature of the pneumonia of childhood.

Dr. Blackader: We all recognize the preparatory drop of temperature in pneumonia, but I have never before seen the same character of crisis as I described in my paper.

Dr. A. Seibert: When I am called to see a child with a sudden rise of temperature in the afternoon or evening, and symptoms apparently referable to the lungs, I make it a point to wait until morning, and if the temperature is 100° or below, I call it influenza. As to the treatment of these enormously high temperatures that Dr. Holt reported, I would like to call attention to something I suggested several years ago, that is, the introduction of a fairly large dose of antipyrine in solution into the rectum. It relieves the muscular tension and the hyperæmia of the brain promptly, and nothing will do it better. My custom is to give one dose at once, and if the temperature is likely to be high for the next few days, to order more injections. Later on, when the temperature does not run very high, and there is evidence of bronchitis, hot mus-

tard foot-baths and large doses of quinine are efficacious. Recently I have used the bisulphate of quinine; it does not irritate the mucous membrane, and is as well retained as antipyrine.

Dr. Holt: One point which I forgot to mention was the occurrence of a cough which resembled pertussis. In regard to the matter of isolation and fumigation, I think we have been too remiss. It is one of the most contagious of diseases, and we ought to insist on isolation just as we do in scarlet fever or measles. In some of my cases it has been difficult to stop the disease until fumigation was practised or the patient was sent away. After cases of influenza, we should insist on fumigation and thorough cleaning of the room.

Dr. Blackader: I, too, intended to speak of the cough resembling pertussis. As to fumigation, I agree entirely with Dr. Holt.

Dr. Seibert: Dr. Pruden, in a paper published in the *American Journal of Medical Sciences*, says that sulphur fumigations are absolutely without value.

Dr. Holt: He is speaking then of dry fumes, and says in the same article that if moist fumes are used, they are extremely efficient in killing microbes.

Dr. Augustus Caillé: I think it is pretty well established that sulphur fumigation is a farce, even in the presence of steam. At the hospital, we rely upon ventilation for some time, and washing of the walls and floors with a solution of bichloride.

Dr. E. M. Buckingham: At the present time, the method of disinfecting rooms in the larger number of hospitals in the world is the washing of the walls and floors with bichloride or carbolic acid solutions.

Dr. W. C. Woodward: In Washington, for the past six months, we have relied altogether upon sulphur in scarlet fever, and have had no recurrences.

Dr. Blackader: I hardly think it is right for us to give up sulphur fumigations altogether when clinical experience teaches most of us, that it is not as ineffectual as stated. How seldom after its use do we have recurrences? Surely that would happen oftener if it were valueless. In the absence of anything better, sulphur, with as complete washing of the rooms as we can get, is, I think, something to still cling to.

CASES OF HYPERPYREXIA.

BY HENRY DWIGHT CHAPIN, M.D.

New York.

The unstable condition of the heat-regulating centres in early life renders hyperpyrexia at this time a common symptom. Attention is here called to a form of excessive temperature that occasionally ensues in connection with intestinal indigestion and fermentation. Dr. E. Centanni (*Deutsche Med. Wochen.*, Feb. 22d, 1894), calls attention to a very high fever which may be produced through non-pathogenic bacteria, for instance, by eating rotten food, the disintegration of necrotic parts, and through stagnant secretions in gastro-intestinal disturbances. The author states that the first studies upon bacterial fever (Traube and Gscheidlen) were made upon the products of decomposition, and that with different kinds of bacteria the pyrotoxic power does not stand in ratio to the pathogenic power. The bacterial fever is produced by a general intoxication with a poison (pyrotoxina bacteria), which is formed inside of the bacteria, and which distinguishes itself from the better-known bacterial poisons (ptomaines, enzyme, toxalbumen,) through its own properties. Dr. Centanni found, in a series of experiments, that injections of pyrotoxin were constantly followed by diarrhœa, the intestinal tract being much affected with the symptoms of fever. Upon section and a study of the anatomical changes, the bowel was filled with fluid feces and mucus, while hyperæmic vessels were present, and great swelling of Peyer's patches. The temperature was first low, then went very high, and finally comes down slowly to normal.

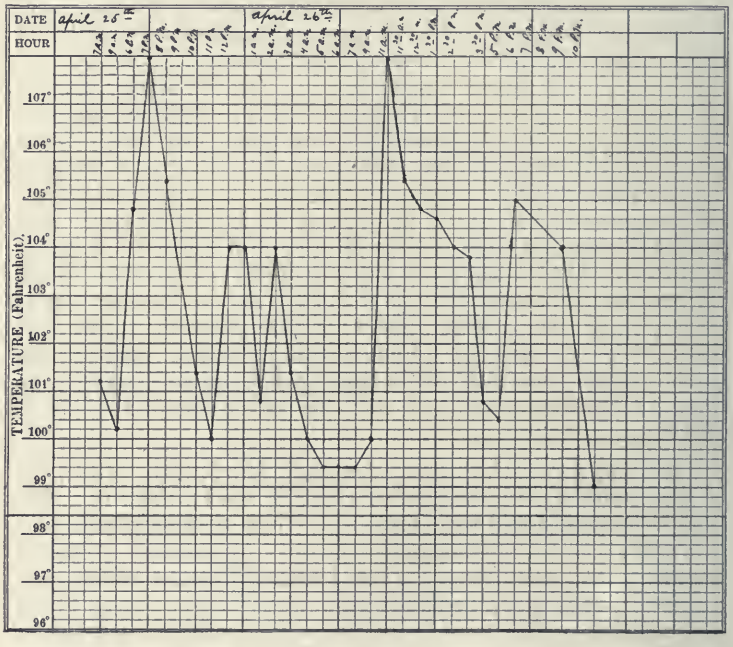
Bessie G., 7 months, was admitted to the Babies' Ward, June 11th, 1894, for diarrhœa. She had been well until eight days before, when she was seized with vomiting and refused nourishment. The bowels became loose, there being several green, watery, curdy stools in the twenty-four hours. She did not rest, and cried constantly. The temperature on admission was 99° F. but in a few hours it suddenly rose to 105° F., but soon dropped to 101⅖° F. The following day the temperature rose at 8 P.M. to 105⅕° F., but dropped in an hour to 100° F. During this time there was no disturbance elsewhere in the body than in the intestinal canal. She improved under careful dieting and treatment, and did not have much temperature until the 17th, when the fever suddenly rose from 99° F. to 105° F., but dropped in two hours to 98° F. On the 24th, she was discharged, as the temperature had been about normal for several days, and the bowel in fair condition, with from three to five stools daily. On June 25th, she was brought back to the hospital on account of a very restless night, with constant crying. I suspected she had been carelessly fed, as a woman took her to board, but did not have a chance to inspect any of the discharges. The temperature at noon on admission was 98⅖° F., but it rose steadily, until at 9.30 P.M. the thermometer in the rectum registered 110.4° F. A careful physical examination showed no local disturbance elsewhere than in the bowel. At 10.30 P.M., the temperature was 109° F., when the baby died. No autopsy allowed.

Geo. S., 5 months, was admitted June 26th, 1894, at 4 P.M., with a temperature of 107⅖° F. and pulse 216. He had been well until two days ago, when he was placed in a nursery. Great restlessness ensued, and several greenish stools. The baby was in a condition of tetany, with opisthotonos, legs stiff, and feet extended. There was tonic contraction of the muscles of the arms, hands, and fingers. The fontanelle was depressed, and the pupils reacted but slightly to light. The baby died in two hours, with a temperature of 102° F. The autopsy showed the heart, lungs, kidneys, liver, and spleen to be normal. The only lesion found was well-marked enlargement and inflammation of Peyer's patches in the large intestine.

Anna S., 8 months, was admitted April 24, '95, with symptoms of laryngismus stridulus. She had been constipated, always crying with apparent distress upon movement of the bowels. Upon the following day she cried a great deal, did not take food well, and the temperature rose to 108° F., followed by two convulsions. The tem-

perature chart for two days is shown, as the fever again rose to 108° F. She had an irregular and not high temperature, with intestinal indigestion until May 15th, when the fever suddenly rose to 106⅘° F. In four hours it dropped to 98⅗° F., and remained down for two days, when she was removed from the hospital.

In the cases here cited, and in not a few similar ones that I have seen, the hyperpyrexia evidently came from causes within the intestinal canal, probably from absorption of pyrotoxin developed from bacteria. In a



majority of cases of sudden and extreme rise of temperature, the cause will be found in the digestive tract. The treatment must consist in a speedy clearing out of the bowel, cutting off fermentable food, and a thorough application of cold. Convulsions or coma are apt to ensue if the excessive temperature is not quickly reduced, and free stimulation will be required. Infants with rickets are especially liable to develop unusual temperatures. In most cases I have seen of the latter, there have been appreciable symptoms of rickets present.

DISCUSSION.

Dr. A. Seibert: I can record a case of hyperpyrexia in an infant in the child of one of the gynecologists of New York. When four months old, the child suffered from indigestion. In the evening I was called, when both the father and myself measured the temperature as 107½°. I concluded it was due to absorption from the alimentary canal, and used a stomach tube to remove the contents of the stomach. In three-quarters of an hour, the temperature had fallen to 102° without bathing.

Dr. Augustus Caillé: I wish to add to Dr. Chapin's remarks that the child with a temperature of 108° became infected while temporarily absent from our wards. The rise in temperature was directly due to infection from impure milk. When properly cared for, the temperature at once dropped as low as 96°, thus showing a range of 12° in a rachitic and ill-nourished infant, with no ill results following.

Dr. William P. Watson: Four weeks ago, I saw a case of marked intestinal sepsis in an infant ten months old. It had suffered with athrepsia since birth, being fed at the breast during the first few weeks, and then on cow's milk prepared in various ways, together with numerous proprietary foods. A wet-nurse was finally obtained. The temperature had ranged three or four degrees above normal for several days before I saw it in consultation, when it was 105°. It was very much emaciated, the eyes were sunken, the fontanelle depressed, and it was exceedingly restless. There were frequent passages, which were thin and very offensive. It vomited everything taken into the stomach. There was no evidence of disease of the head, chest, or abdomen. I suggested the use of a wine-glassful of hot water every fifteen minutes, and an ounce of hot salt water (half drachm to one pint) after each movement, and in twelve hours afterward it was put on a mixture of milk, cream, and water, peptonized with the peptogenic milk powder, which it retained. Within forty-eight hours, the vomiting, purging, temperature, and restlessness disappeared, and the infant has since improved daily.

Dr. A. Jacobi: I take it for granted that the cases reported were well taken care of in the wards, and do not understand why the temperatures of the babies living under improved circumstances should rise and fall always from the same alleged cause. It struck me that part of those temperatures might have been explained differently.

Dr. H. D. Chapin: The cases I reported were all rickety and therefore had unstable nervous systems. The child which Dr. Caillé refers to was boarded out for a while, and came back with a high temperature. It had been carelessly fed. One other case was brought in with symptoms of fermentation and high temperature. In the other case mentioned, the sterilizer was out of order and the milk was infected.

AN ACUTE CONVULSIVE DISEASE IN AN INFANT SEVEN DAYS OLD, THE SYMPTOMS RESEMBLING TETANUS NEONATORUM WITH ABSENCE OF TRISMUS.*

BY IRVING M. SNOW, M.D.

Buffalo.

The patient, of German parentage, was born after a normal labor ; the presentation was cephalic ; no instruments were used. The baby, a boy, was of average weight, was not asphyxiated during parturition, urinated and had a stool in the first twenty-four hours of life. The umbilical was cut short and dressed with borated cotton. For the first six days of life all went well ; the child showed every evidence of a vigorous physique, nursed its mother and moved arms and legs in a natural manner. On the morning of the seventh day it seemed restless, took but little breast-milk and vomited once. About noon the nurse found the baby cyanosed and gasping for breath ; almost immediately it stiffened out in the attitude of opisthotonus, and respiration was for a moment arrested. By means of artificial respiration in a warm bath, breathing was re-established. Nevertheless, the eclampsia in a short time again recurred with slow, irregular respiration, retraction of the head, bending backward of the trunk. For two hours one convulsion followed another at short intervals At this time I saw the child. It was in a violent convulsion, and my colleague, Dr. M. A. Crockett, was making artificial respiration. After a few moments

the spasm relaxed and the following condition was noted: There was no jaundice; the umbilicus was nearly healed; there was no pus nor secretion on the scar; the cord had fallen on the fifth day. The child was apathetic. There was general muscular relaxation; the knee jerks were increased. Throughout the cardiac area the heart sounds were strong and clear; there was no epigastric pulsation. Air entered all parts of the lungs; the breath sounds were harsh and puerile; there was no pulmonary collapse.

The pupils were dilated, with no response to light. The pulse was 160, strong and regular; respiration, 30; temperature normal. There was no paralysis of any limb such as might be expected were the symptoms due to a meningeal hemorrhage. During the remainder of the child's life the convulsions returned every fifteen or twenty minutes. The first symptoms were invariably marked irregularity, slowing and then absolute arrest of respiration, the patient bent backwards in the position of opisthotonus. The arms and legs were not stiffened, nor was trismus or twitching observed about the face. In fact, the chief symptom of the malady was the sudden cessation of breathing every fifteen or twenty minutes. So long did these periods of apnœa last that we were afraid to allow them to terminate spontaneously. The pulse just before and for the first few moments of the spasm would be strong and regular, soon the rhythm would be disturbed and the pulsation would grow weaker. After witnessing several of these attacks it became evident that the only way to keep the child alive was by making artificial respiration most of the time. At times even this was unsuccessful, and we resorted to mouth to mouth insufflation. To prevent the child losing heat the room was kept very hot, and the patient lay in a warm bath. During the periods of apnœa the complexion was usually pale; only once did the infant become livid; occasionally in the attacks there was frothing at the mouth and bleeding from the nose. After the spasm was over the respiration would again become normal, thirty to thirty-six to the minute; the pulse from 160 to 180.

At 3 P. M. the rectal temperature had risen to 101° F. Between 6 and 8 P. M. oxygen was continuously given. It always had the effect of strengthening the heart. From hour to hour the patient grew weaker. Twice the attempt was made to give nourishment by the mouth. Each time that milk or whiskey and water was administered the infant would stop breathing. So severe was one attack of apnœa after putting breast-milk in the mouth that we con-

cluded that the pharyngeal reflex was abnormally increased from some bulbur lesion. The patient was given whiskey, oxygen and once one four-hundredth grain of strychnia hypodermically. At 2:30 A. M. the child died, there being continuous attacks of apnœa and opisthotonus. No autopsy was permitted. The parents were young and healthy. The puerperal period was short and without fever. There was no evidence of syphilis or tuberculosis in the family. The accoucheur was a conscientious aseptic surgeon. There was no inflammation or pus about the umbilicus. The symptoms were at first ascribed to meningeal hemorrhage, yet in the writer's opinion this may be absolutely excluded, as a meningeal hemorrhage extensive enough to destroy life would cause convulsions within forty-eight hours after birth, while the child remained in apparently perfect health until it was seven days old.

The illness was excessively acute, lasting only fourteen and one-half hours. The symptoms of apnœa and opisthotonus were evidently bulbur in origin. The respiratory pauses were due to spasm of the diaphragm and not to laryngismus, as air easily entered the lungs during artificial respiration. All fluids put into the mouth were regurgitated through the lips and nose ; as quickly as they touched the posterior pharyngeal wall a cessation of respiration took place.

An explanation of the symptoms is difficult, unless they be ascribed to tetanus neonatorum. The apnœa and opisthotonus appeared within forty-eight hours after the fall of the umbilical cord. This is the usual period of incubation of the tetanus bacillus, which in infants finds its avenue of invasion through the unhealed umbilical wound. It is known that the shorter the period of incubation is, as shown by the interval between the fall of the cord and the appearance of the symptoms, the more acute and quickly fatal is the disease. In the history of the acute convulsive disease we have recorded, apnœa impeding respiration and opisthotonus were the most prominent symptoms, trismus not being observed. Yet tetanus, even in infants, presents a varying clinical picture, and the cause of death is usually from respiratory embarrassment. There was no evidence of septicæmia, no inflammation or pus about the navel.

The bacillus of tetanus, an anærobe, is only found in the deeper portions of a wound, not in the blood. The constitutional symptoms of the disease are due to a ptomaine. The vehicle of contagion may have been in the dust of the dwelling, as the father, a silversmith, had nothing to do with garden earth or horses.

The bacillus of Nicolaier is indeed difficult to discover, even in typical cases. Of ten cases of tetanus neonatorum reported by Papiewski, of Graz, in nine no bacillus was found, and inoculations were negative.

Tetanus is rare in Western New York. No case of tetanus neonatorum has yet been recorded in the city of Buffalo. Yet as few of the physicians of the city have any experience with the disease, and most of the profession are wholly unfamiliar with its symptomatology, it may happen that occasional cases occur, and are returned as dying from convulsions.

A CASE OF TETANUS NEONATORUM.

BY WALTER LESTER CARR, M.D.

New York.

The following is the history of a case of tetanus which I saw with Dr. H. R. Purdy, of New York, to whom I am indebted for the notes :

On November 24th, 1894, a woman brought to the out-door department of Bellevue Hospital her girl baby, aged ten days. The mother said that she and her husband were healthy. They had five other children, all well. Three years ago she lost a baby of nineteen months with "inward spasms." She had a baby boy who died five hours after birth. He did not have convulsions, but he was unable to open his mouth.

The family lived in a tenement-house on the east side of the city. The infant who was presented for treatment was born without difficulty. A midwife was in attendance. When five days old the mother noticed that the baby was unable to nurse. She said : "I could not make her take the nipple into her mouth. I had to force milk

into her mouth with a spoon. The jaws could be opened just wide enough to get the tip of the spoon between them. The woman who confined me said that the baby must have sore throat, but she could not open the jaws to look at the throat. At times, when feeding, she would stiffen all over and get very red in the face. The cord came off the fourth day after birth. The navel looked red, but not sore." A day or two later a little matter, very thin, oozed from it.

When the infant was brought to Bellevue, on the fifth day of the illness, the jaws were immovably fixed, with the interspace between them described by the mother. The forearms were flexed. It was not until two days later that the infant showed evidences of tetanus other than trismus. The symptoms were no doubt aggravated by exposure to cold and wind while being brought to the dispensary. In addition to the symptoms already mentioned, the following were noted: The thumbs were drawn across the palms and clenched by the fingers; there were convulsive movements of the toes and at times of the whole body. The eyelids were tightly closed and the forehead wrinkled. All these symptoms were increased by any attempt to feed the baby. Deglutition was quite difficult. The temperature was 101° F. in the rectum. Emaciation was not marked, and for only two days was it necessary to resort to rectal alimentation. Without going into further details, it may be stated that the infant had all the alarming symptoms of tetanus and at times a temperature of 104.5° F.

Treatment—The umbilicus, though it did not appear unhealthy, was kept clean with a solution of bichloride of mercury. The bowels were opened by calomel. A half-grain of chloral was given every two hours for two days; then an increase in the dose being necessary, the quantity was doubled This was continued for two days, when two grains of bromide of soda was added to each dose. The combination acted better than the chloral alone. Whiskey, in five-drop doses, was administered every four hours. The treatment was pursued for fifteen days. The baby made a perfect recovery.

6 EAST FIFTY-EIGHTH STREET.

A CASE OF CARDIAC ANOMALY.

BY GEORGE N. ACKER, M.D.

Washington, D. C.

Maggie K., female, white, aged six years, entered the Children's Hospital on October 20, 1890. The father and mother were well. The mother had had seven children, all of them healthy with the exception of this one. At the request of Dr. Lamb, I questioned the mother closely about the first weeks of the pregnaney, as he thought that the anomaly "might be due to some particular trouble during the first two months of the fœtal life of this child, especially about the seventh week." She stated that the pregnancy was without any unusual symptoms. Also, in view of the abscess, I tried to get a history of ear trouble, but found that the child never had any ear disease and the hearing had always been good. The child was born "more dead than alive," and the physicians had great trouble in resuscitating her. She was of a blue color from birth. When three years old she had icterus as a complication of pertussis. Since then she has had a cough with some expectoration. She has frequently complained of pain in the region of the heart. For years she has had spells when she would appear as if dead. These occurred nearly every day, especially if excited or she had any sickness. She would sweat heavily after these attacks. In December, 1889, she had an attack of influenza, and since then has been subject to convulsions of an epileptiform nature. The mother describes the attacks as being attended with rigidity, eyes fixed and staring, with occasional frothing at the mouth and loss of consciousness. These convulsions came on daily, and were accompanied by involuntary evacuation of the feces. After the influenza she had about two dark blue pulmonary hemorrhages daily. She also passed blood by the bowels.

Present Condition.—Fairly well nourished. Marked blueness of skin, particularly around mouth and ends of fingers. The ends of the fingers and toes are clubbed. She is sluggish of movements and is slow in answering a question, but cannot be called dull. Respirations shallow and rapid. Broncho-vesicular breathing and a few râles anteriorly. Broncho-vesicular breathing posteriorly. Heart sounds normal, perhaps a little dull. Apex beat two inches below and one inch to the left of the nipple.

October 23.—After a hard coughing spell to-day, during which the patient was of a dark blue color, she had an attack. Nothing was noticed except a marked cyanosis and hard, labored breathing. Muscular system was flaccid; no frothing at mouth. Pupils regular in size. For several hours afterwards she had a severe headache.

October 26.—Was removed from the hospital to-day. During her stay she had improved somewhat. She played with the other children and was cheerful.

December 4, 1890.—Child readmitted to the hospital. She has been growing worse since she left, the cyanosis being more marked.

January 10, 1891.—No change. Occasionally has attacks of dyspnœa, during which the cyanosis is greater and heart's action becomes weak, but she does not lose consciousness.

February 15.—Had an attack, during which the heart apparently failed to act and respiration nearly ceased. Hypodermics of whiskey and artificial respiration revived her.

May 10.—No change.

June 4.—Very rarely has an attack and always slight.

September 15.—Slight attacks after exertion. Is becoming weaker mentally. She will laugh in the most ridiculous manner at nothing.

October 18.—No attack of dyspnœa for a month. Is gaining rapidly in flesh.

October 30.—Condition unchanged.

November 14.—The child is doing well. She never exerts herself by running or violent play. Appetite good.

December 1.—Cyanosis gradually becoming less. A patch of tinea tonsurans (size of a quarter of dollar) appeared on the right forehead near the scalp. This yielded to treatment and disappeared in January, 1892.

February 13, 1892.—Rise in temperature and eruption of chicken-pox. This ran a favorable course.

April 29.—Had a slight fainting spell, with pain over the heart. Did not turn blue.

May 28.—Had two slight attacks during the week.

June 4.—Has slight attacks at intervals, but the general condition is much improved.

June 16.—Discharged at the request of her parents.

July 26, 1894.—The child readmitted to hospital. Since her discharge from the hospital she has remained well until four days ago. She was then taken with an attack in which she shook and trembled for about half an hour. Since then her left arm has been paralyzed. Yesterday her left leg became weak. She appears fairly well nour-

ished. The mental condition is not good. The face and hands are very blue. Capillary circulation is sluggish. The first heart sound is prolonged and the second sound is dull. The lung sounds are clear. She is constipated. The tongue is coated. She vomits after eating. The ends of the fingers are much enlarged; the toes also to a less extent. There is no sensation or motion in the left arm. The sensation is almost intact in the left leg, but she cannot bear much weight on it when she walks, which she is able to do with the aid of others.

July 29.—Vomits occasionally about half an hour after taking milk. Appears languid. Voice feeble and plaintive. Is anxious to get out of bed.

July 30.—Condition unchanged.

August 5.—No change. She vomits several times daily. Complains that the food makes her sick.

August 6, 11 P.M.—When she was given milk it was noticed that she was specially dull and drowsy and that she took the milk with great difficulty. From that time she became more and more comatose.

August 7, 3 A.M.—In absolute coma. Dilated pupils. Stertorous breathing (Cheyne-Stokes) and slow pulse. Face of a deep purple color. The right pupil did not contract to light, but the left one contracted slightly and remained so, not dilating when the light was withdrawn. The muscles of forearm (flexors of hand) in a clonic spasmodic condition. The extensors of the forearm were in a spastic condition, so that the forearm was flexed with difficulty. Then there followed for half an hour contraction and relaxation of the muscles of the forearm.

11 A.M.—The breathing changed gradually into a more normal variety. The coma continued unchanged, except that she was sensible to the prick of a pin or tickling the sole of the foot, moving arm or leg under these conditions. As it was impossible for her to swallow anything, nutritive enemata have been given.

August 8.—Died at 4 A.M. Respiration very noisy as the end approached. Cessation of heart's action preceded that of respiration.

Post-mortem Examination.—At 12 noon, eight hours after death, rigor mortis well marked. Skin of a dark purplish color. No deformities. Much fat in the chest walls; omentum also contained fat. Blood flowing from the incisions of a dark, tarry color. Little fluid in the pleural cavities. Lungs appear almost black. The right lung was strongly adherent to the chest wall. Kidney and

spleen enlarged and distended with blood. Vessels of the brain full of blood. There was a collection of grumous blood near the anterior part of the right temporo-sphenoidal lobe. Just back of this was an abscess containing greenish pus.

The brain, heart and lungs were sent to Dr. D. S. Lamb for examination.

REPORT OF DR. D. S. LAMB.

The heart and lungs were placed in my hands under circumstances requiring haste in dissection, to facilitate which the lungs were disconnected from the heart. This action was unfortunate as preventing the establishment beyond question of the source of blood supply to the lungs.

The malformation of the heart and great vessels consists in the following: Foramen ovale patulous and one-half inch in diameter.

Interventricular septum incomplete in upper part, where there is an opening one-half inch in diameter.

Pulmonary artery arises from the left ventricle in the usual aortic situation as a *cul-de-sac*, with one rudimentary valve. On the corresponding internal ventricular surface is a dimple. Repeated attempts failed to discover even the slightest communication with the artery.

The aorta arises from the conus arteriosus of the right ventricle. The ascending aorta is one inch in diameter; walls not abnormally thickened; valve segments of the usual thickness; right coronary opening large, left quite small. They opened respectively behind the right and posterior leaflets. From the upper curve of the transverse portion of the arch arise six branches, three large and three small. The innominate, left common carotid and left subclavian arteries are identified without difficulty; the remaining three vessels are situated immediately to the right and in front of the innominate. From their position and relative size I infer that the right one, the larger, and the left, the smaller, communicated respectively with the right and left lung, and I presume are non-obliterated fifth primitive aortic arches. The sixth vessel is the smallest and most obscure, and I can only conjec-

ture as to its distribution. Whether the two vessels which, in my opinion, communicated with the lungs also communicated with the pulmonary arteries, is not now evident, but I think it probable.

The largest diameter of the trunk of the pulmonary is one-half inch. From the upper curve of its left division and just beyond the origin of the right division is a narrow vessel which connects with the branch of the aorta which I have suggested as passing to the left lung. This communicating vessel is undoubtedly the ductus arteriosus. It is patulous to a very limited extent at its pulmonary end; at its aortic end there is only a dimple and valve-like pad.

Both auriculo-ventricular openings are smaller than normal. The auricular cavities are of normal size; the walls of about normal thickness. Both ventricular walls are one-fourth inch thick. The right is, therefore, hypertrophied; the interventricular septum of normal thickness. Ventricular cavities are small.

It is to be regretted that at the time of removal of the specimens, the systemic arterial connections were not noticed, just as also it was unfortunate that the lungs were prematurely separated from the heart. The cause of the cyanosis was evidently the interauricular and interventricular commingling of the blood, the color of which must have been that of a mixture of arterial and venous blood. Altogether the heart is small for a child of ten years.

In view of the blind action of the pulmonary artery, both the systemic and pulmonary blood passed through the aorta, and the latter is accordingly increased in diameter. The blood returned from the lungs through the usual pulmonary veins, as also from the system by the cavæ.

The character of the malformation would suggest a disturbance of development at or before the seventh fœtal week. The closure of the origin of the pulmonary artery determined the patency of the auricular and ventricular septa. The transposition of the great vessels was caused by the deviation of the septa of the bulbous arteriosus.

Many cases of transposition of the great vessels con-

joined with the heart have been reported. In a rapid review of a large number, the one which seems to most nearly approach in its entirety of anomalies to the present one, is that of Habershon in the Trans. Path. Soc., London, 1888, in which the child lived to the age of four years. The assemblage of anomalies in this present case is unique, and the prolongation of life to the age this child attained is quite unusual. Cases of malformation of heart in which abscess of a cerebral hemisphere has occurred usually have a history of disease of the corresponding ear.

Report of bacteriological examination by Dr. Walter Reed, Curator, Army Medical Museum: "As soon as Dr. Lamb brought the brain into my laboratory, I made cultures on agar plates, using all necessary precautions to avoid contamination, and afterwards made several coverslips from the greenish ropy contents of the abscess. I also inoculated a white mouse with a drop of the pus. Upon examining the coverslips, my attention was at once arrested by the very large number of diplococci which were present, many of these showing a capsular staining. The agar plates, three in number, were examined at the end of forty-eight hours, and showed only numerous colonies of the diplococcus lanceolatus. As soon as the organism was isolated in pure culture, I inoculated several white mice, using as much as ½ c.c. of a twenty-four-hour bouillon culture, but failed to obtain any pathogenic effects. The result of the animal inoculations shows that the organism had lost its virulency. As to the identity of the organism I have no doubt, since many of the pairs showed, both on coverslips taken from the abscess and from the agar plates, the well-known capsular staining characteristic of the diplococcus. Its lanceolate shape was also well marked."

PATENT VENTRICULAR SEPTUM IN A MAN OF TWENTY-NINE YEARS.

BY A. JACOBI, M.D.

New York.

Sam. R., a Russian, twenty-six years, was taken suddenly ill on July 24, 1891. Dr. H. B. Adler found him gasping with dyspnoea, palpitations, pulse uncountable, generally livid, fingers and toes of deep blue color. There was a loud cardiac murmur, the character of which was not made out, and a fairly normal size of the heart. The patient stated that his lips and nails had been blue, more or less, for twelve or fourteen years. He was given digitalis and felt better after a very few days. Digitalis and potassium iodide were ordered afterwards.

The same medical gentleman saw him on the 12th of February, 1892. Digitalis and the iodide had not been taken. This attack was similar to the first. The heart beats could not be counted ; the impulse of the heart was plainly visible. A subcutaneous injection of morphia brought speedy relief ; digitalis was given in large doses ; and the patient went about his business twelve days after.

He got married the 9th of September, 1893, had a new attack on the 29th and was laid up ten days, and again on the 29th of December, from which it took him several weeks to recover.

He called on me the 2d of March, 1895. Was at that time twenty-nine years old. Living at a distance of three miles, he had to take street-cars and to walk part of the way. He rested an hour before he could see me ; had a pulse of 104, small, fairly compressible, complained of palpitation, which he said he had eight years, an occasional pain about his chest, and dyspnoea. His complexion was sallow, his lips blue, finger-nails blue and markedly clubbed, the toe-nails in a similar condition,

but to a less degree. The veins of the surface, all visible veins in fact, including the jugular, *not dilated.* No jugular pulse. The cardiac dulness *not* at all, or but very little, *extended.* The vertical dimension is somewhat greater. Impulse very strong. There was a very loud systolic murmur (with but little diastolic) over and *about the ensiform process*, less marked at a distance of three centimetres. Its centre was the left margin of the lowest part of sternum.

Diagnosis: Incompetence of the tricuspid valve, patent ventricular septum, and probably congenital stenosis of pulmonary artery.

The patient presented himself again on the 19th of March. General condition not much changed. Under the influence of digitalis and potassium iodide his complaints were less urgent. It struck me there was a change in the murmur, it was decidedly musical, and I concluded some physical alteration must have taken place about the tricuspid valve or the patent septum. At that time his photograph was taken, after the outlines of the heart had been carefully marked with an ink pencil.

March 26th, I saw the patient in consultation with Dr. H. B. Adler. There had been pulmonary hemorrhages for some days; the blood was liquid, also at times coagulated. Disseminated rales over both lungs, particularly the upper lobes. Heart murmurs still musical, less so, however, than previously, may be either from diminished blood quantity, may be from further local changes. At all events, it appeared to us that a connection was to be found between the sudden origin of the musical sound and the presence of pulmonary hemorrhages which we took to be embolic. Temperature 101° F. No dulness.

April 8th, patient again seen in consultation. Hemorrhages had stopped a week ago. Rales quite extensive, both anteriorly and posteriorly. Bronchophony (more marked than actual bronchial respiration) over left upper lobe, anteriorly, and right infra scapular region. Some dulness on those places. Temperature reached 102° F. but once. A few days previously he complained a whole day of *pain over left ear which lasted a day.*

April 15th, consultation because of an incessant and very severe left supra-orbital neuralgia which had lasted five or six days. Pneumonia, hardly recognizable. No elevations of temperature. Occasional twitching of left side of face. Has appeared dull for some days, and more obstinate than usual. Answers questions slowly and rather stupidly. Complains of forgetting names. Aphasic, says spoon when he means bedpan, and makes other mistakes. Neuralgia was, therefore, taken to be of central origin, probably of embolic character, like the previous pneumonias.

April 19th, the patient was transferred to Mount Sinai Hospital, Dr. E. G. Janeway's service. From the hospital records kept by the senior assistant, I copy the following points relating to the history of the patient :

"Remnants of pneumonia still found, heart not enlarged, apex beat fifth space, irregular, systolic murmur at apex transmitted all over, soft and blowing, roughening of the second sound, loudest at fourth space, left. Right facial paralysis—uvula to the right. Temperature 99.2°; pulse 80; respiration 24.

"April 20th, temperature 98.6°; pulse 80; respiration 24. Slept well. Urine 1024, negative.

"April 21st, temperature never over 99.4°; slept well, stupor increasing, neck slightly rigid, areas of dim sensation on right side of face, right hand slightly paralyzed, but its sensitiveness not altered, legs normal—amnesic-aphasia.

"April 22d, temperature not above 98.6°; pulse 68 to 78; twitching of the muscles of left face, sleep good, incontinentia alvi.

"April 23d, temperature 98° to 98.4°; pulse 76 to 80; respiration 24; urine 1023, negative, involuntary. Stupor and rigidity of neck increasing.

"April 24th, 4 A.M., temperature 98°; pulse 78; respiration 24. Slept well till 5.35, became suddenly cyanotic, breathing once a minute. After subcutaneous injection of camphor, atropia and strychnia, respiration increased to four a minute—artificial respiration and oxygen were resorted to until death ensued at 6.15 A.M."

Autopsy the same day at 8 P.M., by the house physician, Dr. Yankauer, under the supervision of Dr. Mandlebaum, pathologist.

Lungs somewhat emphysematous, no pneumonia—some pleuritic adhesions—liver, spleen, kidneys, abdominal organs generally negative.

Heart slightly enlarged—normal pulmonary artery arises from body of right ventricle—no conus arteriosus. The caliber of the aorta is small, the innominata, carotis sinistra, and subclavia are all small and branch off before the arch is formed. Next to the subclavia sinistra there is a small artery directed upwards; probably a vertebral. The left ventricle is small, the right large with eccentric hypertrophy. The ventricular septum, upper part, is patent and admits readily of two fingers. Foramen ovale closed. No ductus Botalli perceptible. Tricuspid valve very much thickened all over and roughened. No recent endocarditis, no thrombi.

Dura mater normal, not adherent. No meningitis. On section of dura the brain bulges out. Brain very soft on left side, normal on right. Pus in posterior horn of left lateral ventricle. It communicates with an abscess extending straight out to upper posterior part of temporo-spheroidal lobe. It does not perforate the surface of the brain. The cavity is cylindrical, two and a-half centimetres wide, five long, the pus (several ounces) thick and greenish. No pus in tympanic cavity, no thrombosis of sinus. The skull shows some softening and fatty degeneration of roof of tympanum, also of mastoid bone.

MALFORMATION OF THE HEART, PULMONARY STENOSIS, DEFICIENT VENTRICULAR SEPTUM, OPEN DUCTUS ARTERIOSUS, AORTA ARISING FROM BOTH VENTRICLES, BUT PRINCIPALLY THE RIGHT.

BY L. EMMETT HOLT, M.D.

New York.

A female child, nine months old, was admitted to the Babies' Hospital three weeks before death. The child had been cyanotic since birth; had never had convulsions; weighed but eight and one-half pounds, and presented all the symptoms of extreme marasmus, from which she died.

The physical examination showed the heart-sounds to be weak, the first and second sounds resembling each other both in character and intensity. It was impossible to locate the apex beat. At one examination it was thought that a faint systolic murmur was heard near the apex. This was, however, doubtful, as it could not be heard at any of the other examinations, although these were made with great care and by several persons. The pulse was weak; there was no clubbing of the fingers or toes; the cyanosis was intense and constant, being increased by crying.

The autopsy showed all the organs normal except the heart and lungs; the latter were in a condition of marked congestion, but showed no atelectasis. The apex of the heart was broad. The aorta was five-eighths of an inch in diameter and arose from both ventricles, the origin being directly over the ventricular septum, but more from the right than from the left ventricle. The pulmonary artery was about one-fourth of the size of the aorta. The pulmonary opening admitted only a very fine probe; this was so small that probably no blood passed through it during life. The ductus arteriosus was open,

the diameter being about one-twelfth of an inch. The right ventricle was much larger than the left and its walls were twice as thick. The ventricular septum was deficient at its upper portion, the opening being one-half an inch in diameter. The right auricle was much enlarged ; the left auricle small. The pulmonary veins were very small. The foramen ovale was closed, and the auricular septum normal.

The systemic circulation was carried on chiefly by the right ventricle, as only a very small amount of blood could reach the lungs through the pulmonary artery by way of the ductus arteriosus. The chief supply to the lungs was probably through the bronchial arteries.

DISCUSSION.

Dr. F. A. Packard: I wish to report a case similar to two of those reported to-day. This patient also had cerebral abscess. The man, a sailor, had been working up to two days before admission to the hospital, two weeks before. He had Jacksonian epilepsy of the right arm. He was questioned in regard to cyanosis, but gave no history of having had it. The epilepsy increased, and he died three days later in coma. At the autopsy, the base of the skull was found normal. The heart was large, both auricles were dilated, the foramen ovale was patent, and the fore-finger could be placed in the opening. At the ventricular septum, there was also a deficiency in which the finger could be placed.

Dr. A. A. McDonald: I would mention a case of mine that had but one auricle and ventricle, and she lived to be twelve years old. Her only symptom was cyanosis. She died of congestion of the lungs.

Dr. J. P. C. Griffith: I am struck by the fact that here are three cases of perforate septum, one having well-marked murmur, one without any, and one doubtful. Can Dr. Osler tell us the character of the murmur now, after having seen this case?

Dr. Wm. Osler: I had only an opportunity of examining the case once. The murmur was very remarkable, and resembled exactly one which I had heard in two cases of communication between the aorta and the vena cava. I would like to call the attention of the members to the importance of making a proper dissection in these cases of congenital heart disease. If there is plenty of time, make the dissection of the arterial and venous trunks *in situ;* if

not, cut the vessels and trachea high in the neck; strip out from the front of the spine the thoracic viscera; cut across at the level of the diaphragm and remove for subsequent careful dissection. Would it not be interesting hereafter to have one afternoon devoted to the exhibition of anatomical specimens, taking up each year some subject as directed by the Council?

Dr. A. Jacobi: These cases are certainly remarkable. Some spoke of cerebral complications. It is possible that abscess in my case had something to do with it. The dura mater was normal, and it was difficult to see how abscess of the brain depended on a change in the bone. It appears to be common in such cases.

SARCOMA OF THE KIDNEY IN AN INFANT; TREATMENT WITH ERYSIPELAS TOXIN.

BY J. HENRY FRUITNIGHT, A.M., M.D.

Visiting Physician St. John's Guild Free Hospital for Children, New York; Fellow, New York Academy of Medicine.

On January 12, 1895, Mrs. B. brought to my office her infant, aged thirteen months, for examination. The patient, a boy, was fairly well nourished, but presented a protuberance in the right lumbar region and hypochondrium. Nothing abnormal was to be observed elsewhere. The mother stated that she had first noticed the abdominal swelling about three weeks previously, but it certainly must have existed for a considerable period of time before it was observed by her. All the functions of the child were normal, physical examination of heart, lungs, spleen and liver was negative. Owing to the restlessness of the patient a careful examination of the abdominal enlargement could not be made at this time. In consequence a provisional diagnosis of an abdominal tumor probably malignant and probably connected with the kidney was made. The mother was directed to bring the child to the Children's Hospital of St. John's Guild in this city on January fourteenth, for the purpose of making a more exact examination under an anæsthetic and of permitting Dr. Abraham Jacobi to see the patient. Accordingly on that date the patient was brought to the hospital and having been put under chloroform anaesthesia by the house

physician, Dr. M. Victor Safford, he was carefully examined by Doctors Jacobi, Mark Blumenthal, Safford, and myself. The hilum of the kidney could be distinctly felt turned toward the left and it was decided positively that the neoplasm was attached to the right kidney. Furthermore the conclusion was arrived at that the tumor was a sarcoma. The patient was a few days later exhibited by Prof. Jacobi to his class at the College of Physicians and Surgeons.

It will be in order to narrate to some extent the family history of the patient. The mother has always been healthy. She has had two previous children, respectively four and three years old. With this child she was in labor about twelve hours. All three labors were natural. The mother's parents are still living at the age of about sixty years. The father's mother is still living, but his father died when he was still a child and consequently he does not know the cause of his father's death. No member of the family has ever had a tumor. In neither parent are there evidences either of syphilis or of tubercular taint. I omitted to state that the right foot and leg began to swell about one week after the tumor was first discovered by the mother, that is about two weeks before the patient was first seen by me.

As the mother refused to leave the child at the hospital, the patient at the suggestion of Dr. Jacobi was placed upon Fowler's solution of arsenic, two drops, three times a day. At length, after having been thus treated at its home by me for a month, the mother finally yielded to my persuasions to leave the child at the hospital. He was admitted to the St. John's Guild Children's Hospital on February 12, 1895, in a condition practically unchanged from that of a month previous. The accompanying diagrammatic sketch represents the appearance of the abdomen very well at the date of his admission.

The photograph was taken after the child had been in the hospital for about two weeks. I beg to say just here that later on I shall give a table of comparative measurements of the abdomen made at different dates.

On February 16 a very careful analysis of the urine was

made by Dr. Frank Grancle, pathologist to the hospital, with the following results. The chemical examination showed: Color, smoky; reaction, alkaline; specific gravity, 1012; albumen, 10 per cent.; sugar, none.

The microscopical examination revealed: Stellar phosphates, amorphous phosphates, granular matter, some red blood corpuscles, some pus cells, some epithelial cells, no casts. The urine was re-examined on four successive occasions, each examination disclosing the fact of a progressive increase in the percentage of albumen present. *Pari*

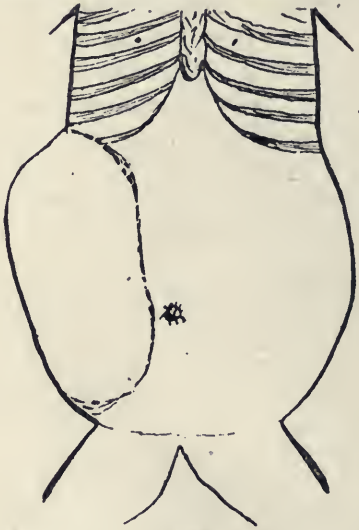


FIGURE 1.—APPEARANCE OF ABDOMEN AT DATE OF ADMISSION TO HOSPITAL, FEBRUARY 12, 1895.

passu the patient became weaker and weaker with a tendency to somnolency, accompanied by a general emaciation. On March 7 marked dyspnœa appeared, physical evidences of broncho-pneumonia were present, and cyanosis was apparent. His condition grew worse hourly and at 11.30 P.M. he expired. Before giving the report of the autopsy it will be more logical to speak of the treatment administered to the patient. As stated in an earlier part of this paper arsenic was given to the patient for a month, but with no appreciable results, beneficial or otherwise. At one of the regular consultations which

SARCOMA OF THE KIDNEY IN AN INFANT OF THIRTEEN MONTHS—DR. FRUITNIGHT.

were held weekly upon the case, Dr. Dillon Brown, one of the visiting physicians to the hospital, suggested the employment of the toxin of erysipelas in the treatment of the patient according to the method introduced and advocated by Dr. Coley of New York City. Accordingly the treatment by erysipelas toxin which contained the *bacillus prodigious* was commenced on February 16, 1895. The first quantity of toxin fluid used was generously provided by Dr. Dillon Brown. At 10.30 A.M. three minims of the toxin were injected in the right gluteal region, the temperature being 99° and pulse 102. At 2.30 P. M. the temperature registered 100° and pulse 106, and at 6.00 P.M. the pulse was 104 and temperature 99⅘°. At 8.30 A. M. on February 17 the temperature being 99⅖° and pulse 102, four minims of the toxin were injected. I may say here that the injections were all done in the right or left gluteal region. At 2.30 P.M. the temperature was 98⅖° and pulse 100, and at 11.00 P.M. the temperature was 100⅕° whilst the pulse was 126. On February 18 at 10.20 A.M., eight minims of the toxin were injected, the temperature being 98⅗° and pulse 132. At 2.20 P.M. the temperature was 99⅕° and pulse 132, and at 6.20 P.M. the temperature was 99⅘° and pulse 122. At 9.45 A.M. on February 19, nine minims are injected deeply in the left thigh, the previous ones having all been injected into the right side. At the time of the injection the temperature was 97⅗° and the pulse 120; at 2.30 P. M. the temperature was 97⅘° and pulse 108; at 6.40 P.M. the temperature was 99⅕°, the pulse 108, and at 11.20 P.M. the temperature was 100° and pulse 120. On February 20, at 10.15 A.M., twelve minims of the toxin were injected in the left buttock, the temperature being 97⅗° and pulse 116; at 2.40 P.M. the pulse was 120 and the temperature 99°, and at 6.30 P.M. the temperature was 99⅖° and pulse 124, and at 10.20 P.M. the pulse was 132 and temperature 100⅗°. On February 21, at 10.10 A.M., twelve minims of toxin were injected into the left side, the temperature being 99⅗° and pulse 126; at 2.30 P.M. the temperature was 99⅗°, pulse 126; at 6.00 P.M. the temperature was 100⅕° and pulse 132, and at

10.10 P.M. temperature was 99° and pulse 120. On February 22, at 10.50 A.M., the temperature being 99⅘° and pulse 138, eight minims of toxin were thrown into the left buttock. At 2.50 P.M. the temperature was 99⅘° and pulse 132; at 6.30 P.M. the temperature was 99⅘° and pulse 132, and at 10.30 P.M. the pulse was 128, temperature 98⅘°. On February 23, at 10.40 A.M., fifteen minims of the toxin were injected on the left side, the temperature being 100⅕° and pulse 120; at 2.40 P.M. the temperature was 100° and pulse 102; at 6.00 P.M. the temperature was 100⅘°, the pulse 138, and at 10.00 P.M. the temperature was 99⅗° and pulse 126. On February 24, at 10.40 A.M., temperature being 100⅖° and pulse 120, seventeen minims of the toxin were injected in the left side. At 2.30 P.M. the temperature was 101°, the pulse 120; at 6.30 P.M. the temperature was 101°, the pulse 118, and at 11.30 P.M. the temperature was 99⅘°, the pulse 120. As the supply of toxin had now become exhausted the treatment was interrupted until March 1, when a fresh quantity of the toxin was received. Since the last injection of toxin the temperature had remained in the neighborhood of from 100° to 101°. At 8.45 A.M., March 1, two minims of the new toxin were injected in the left buttock, the temperature being 99⅖° and pulse 124; at 1.30 P. M. the temperature was 99⅘° and pulse 120; at 6.45 P.M. the temperature was 100⅕°, pulse 128, and at 11.35 P.M. the pulse was 132, the temperature 100°. March 2d, at 10.15 A.M., four minims of toxin were injected in the left side, the temperature being 99⅖°, pulse 130; at 2.30 P.M. the temperature was 100⅕, the pulse 130; at 6.30 P.M. the temperature was 100⅕°, the pulse 132, and and at 10.30 P.M. the temperature was 99⅘° and pulse 125. The patient now began to suffer from abdominal distension and had a loose cough; he also refused his food. March 3d, at 9.20 A.M., seven minims of toxin were injected, the temperature being at 99°, the pulse 122; at 2.30 P.M. the temperature was 100°, the pulse 122; at 6.30 P.M. the temperature was 100⅖°, the pulse 128. On March 4, at 9.45 A.M., temperature 99⅘°, pulse 120, ten minims of toxin were injected; at 2.00 P.M. the tempera-

ture was 100°, the pulse 122; at 6.45 P.M. the temperature was $100\frac{1}{5}$, the pulse 126, and at 11.45 P.M. the temperature was $99\frac{1}{5}$°, the pulse 136. On March 5, at 10.30 A.M., with temperature 99°, pulse 128, ten minims of toxin were injected in the left gluteal region; at 2.30 P.M. the pulse was 128, the temperature 100°; at 6.30 P.M. the temperature was $100\frac{2}{5}$°, the pulse 130, and at 11.30 P.M. the temperature was $101\frac{3}{5}$° and pulse 132. On March 6, at 10.00 A.M., with temperature at 102°, pulse 136, nine minims of the toxin were injected on left side; œdema very marked in both legs now. At 2.00 P.M. the temperature was $101\frac{3}{5}$°, the pulse 140; at 6.45 P.M. the temperature was $100\frac{2}{5}$, the pulse 140, and at 10.45 P.M. the temperature was $100\frac{1}{5}$°, and pulse 136. On March 7 his condition was so critical that digitalis and whiskey were liberally administered to the patient, and no injection was given, and as previously reported, death occurred at 11.30 P.M. His nourishment consisted mainly of milk, with the addition at times of barley, gruel and beef tea. Stimulants were not indicated until the last day of his existence. Later in the course of this paper I shall take occasion to make some remarks on the treatment of sarcoma with the toxin of erysipelas.

I shall now revert to the findings revealed at the autopsy. The autopsy was made by the pathologist to the hospital, Dr. Frank Grauer, in the presence of the hospital staff at 5 P.M. on March 8, 1895, seventeen and one-half hours after death. Before describing the post mortem conditions I will state the comparative measurements which were alluded to in a previous part of this paper:

Circumference	On Jan. 12	On Feb. 18	On Feb. 25	On March 4
At ensiform cartilage,	15 in.	$17\frac{1}{2}$ in.	$17\frac{1}{2}$ in.	$17\frac{1}{2}$ in.
"2 in. below "	$17\frac{1}{4}$ "	$20\frac{1}{2}$ "	$20\frac{1}{2}$ "	23 "
"4 " " "	$19\frac{1}{2}$ "	$22\frac{1}{2}$ "	23 "	$24\frac{1}{8}$ "
"$6\frac{1}{2}$" umbilicus,	18 "	$21\frac{1}{2}$ "	22 "	$22\frac{1}{2}$ "
At crests of ilea,	$16\frac{3}{4}$ "	$18\frac{1}{2}$ "	19 "	$20\frac{1}{8}$ "
From ensiform cartilage to symphysis pubis,	$9\frac{7}{8}$ "	10 "	$10\frac{3}{4}$ "	$11\frac{1}{2}$ "

At the time of the autopsy the body was much emaciated, there was atrophy of the muscles of the upper extremities and chest. The length of the child was 27 inches. The circumference of the abdomen at the level of the umbilicus was 23½ inches, at the iliac crests 18½ inches. The circumference of the chest was 17½ inches. There was slight œdema of the lower extremities. Ecchymosis of testicles and inner sides of thighs extending back to the arms, along the entire surface of the back and on right

SARCOMA OF THE KIDNEY.

side of neck, most probably post mortem imbibition. On opening the abdomen it was observed that a large mass of the size of a child's head occupied the right side of the cavity dipping down into the pelvis and extending upward on the right side higher than the normal position of the kidney. The intestines were somewhat congested. The descending colon, the lower portion of the small intestines, part of the cæcum, the whole vermiform appendix and portions of the mesentery were adherent to this mass. Subsequent examination showed that the

tumor was also firmly adherent to the abdominal wall, the bladder and the walls of the pelvis by means of its capsule, out of which it could be peeled without much difficulty, though the capsule was quite friable and tore easily. The tumor, which was photographed, weighed 4½ pounds. It measured in its longest diameter 7¾ inches, a diameter at right angles to this measured 5½ and a diameter traversing its largest prominence was 6½ inches. The abdominal cavity contained a considerable quantity of clear fluid.

The intestines were congested in spots, and the follicles at the ileo-cæcal valve were enlarged. The stomach was normal and contained partially digested milk.

The liver extended far below the borders of the three lower ribs, its left lobe extending to the left over the epigastric region and covering the greater portion of the stomach. On the right side the liver extended upward to the third intercostal space. Its lobules were rather pale in sections. In the right pleural cavity clear fluid was found, but none in the left. The left lung showed slight œdema, but no bronchitis. The upper lobe of the right lung disclosed evidences of a broncho-pneumonia whilst the middle and lower lobes were in an extreme state of hypostatic congestion with spots of broncho-pneumonia.

In the pericardial sac there was a considerable quantity of clear fluid. Fluid blood was found in both right and left ventricles. The left auricle contained a post mortem clot. All the valves of the heart were normal and perfect, though there were ecchymoses along the mitral and tricuspid valves. The myocardium was normal and healthy. The spleen was apparently normal. The right kidney was involved in the mass of the tumor. The left kidney was much compressed by the tumor. It was more than twice as large as normal and weighed four ounces. Its capsule was slightly adherent. On section, there was evidence of slight thickening of the cortical substance with loss of striæ. The pyramids were well marked.

The occipito-frontal circumference of the head was 18 inches. The dura mater was thickened and firmly adherent to the calvarium. The pia mater showed slight

congestion. The brain itself was well formed, of decided symmetry, with well defined convolutions. It weighed 32½ ounces avoirdupois. There was a slight ante-mortem extravasation in the upper part of the superior frontal sulcus of the left side. No fluid was found in the ventricles. Spots of ecchymosis were detected here and there in the brain substance.

I will now speak of the results of microscopical examinations of the tumor and of other organs, these having been carefully made and recorded by both Dr. Frank Grauer, the pathologist of the St. John's Guild hospital for children, and Dr. Henry Power, of the pathological laboratory of the College of Physicians and Surgeons, New York City. To Dr. Power I am indebted for the accompanying illustrations of the microscopic appearance of the tumor Cutting into the tumor, it presents a lobulated appearance, the lobules as well as the bands of connective tissue between them varying in size. The lobules are soft and of a whiteish hue similar to that of the white brain tissue. Scattered throughout the new growth are a number of cyst cavities of varying size, but which do not contain any fluid. In the centre of the growth is an irregularly shaped cyst cavity into which projects a process of the tumor reddish in color and measuring four inches in length and two and one-half inches in width. The lower segment of the growth, which resembles the cerebellum in shape and relative position to the whole mass of the tumor, is composed of the kidney which measures three by two by one and one-quarter inches. Kidney tissue seems to extend in an attenuated condition over the growth to the extent of about three inches. The cut surface of the kidney discloses the fact that its cortical substance is somewhat thinner than normal. A cyst of about the size of a small chestnut is found in the pyramidal substance. The pelvis of the kidney is dilated and measures nearly three-quarters of an inch in diameter. The ureter can be traced in the growth near its outer edge for a distance of more than six inches. The tumor apparently takes its origin in the pelvis of the kidney.

A section of the unaffected kidney shows that most of the malpighian bodies are enlarged and that they completely fill the capsule. The convoluted tubules are also enlarged and are filled with proliferated cells and granular matter. In some of the spiral and convoluted tubules the epithelial cells are very much swollen. In the upper part of the pyramidal substance the straight tubules appear normal, but as we pass along to the apex we observe that the tubules disappear and are replaced by newly-formed connective tissue.

On section of the kidney attached to the tumor, all the appearances of a chronic diffuse nephritis are revealed. There are present a round cell infiltration and an increase of connective tissue between the convoluted tubules. Certain malpighian bodies are completely destroyed. In some of the convoluted tubules is found a proliferation of the epithelial cells and in others a disintegration or even a total destruction of the same. Hyaline and granular casts are found in some of the tubules. The straight tubules are for the most part destroyed and replaced by newly-formed connective tissue.

A section of the tumor and kidney combined discloses an alveolar structure filled with round cells. The walls of the alveoli are formed of connective tissue, in which are seen here and there the remains of the uriniferous tubules. The kidney portion shows increased connective tissue with destruction of the tubules.

A section of the tumor taken from that portion close to the pelvis of the kidney shows that it is composed of round cells among which are a few spindle-shaped cells, and what is most interesting and noteworthy, large bundles of *embryonic* striated muscle *cells* in various stages of development intermixed with many-shaped cells of probable connective tissue origin. These striated *embryonic* muscle *cells* were closely studied and appear in Figure 1 reproduced from a photograph taken with an immersion lens and of 500 diameters magnification. Compared with the normal adult striated muscle the following points of difference are noticed:

The striations are more widely spaced, the nuclei far

more large and numerous and the cells shorter, often tapering and always more narrow than the adult form.

A section of the lower part of the tumor shows it to be composed of round cells and a large amount of glandular tissue. The glandular tissue here resembles that found in an adenoma and is not like the tubules of the kidney. The same may be said of glandular tissue in a section taken from the middle of the neoplasm well seen to the right in Figure 2. Here, however, part of the section is composed of a large mass of round cells and part of a mixture of nearly *adult* striated muscle *fibres* as seen (in Figure 2, the low power picture) at the left, and in the high power picture reproduced in Figure 3.

In these muscle fibres the nuclei are slightly in excess over an adult fibre, but no other differences exist.

A fifth section from the outer part of the tumor showed a large amount of necrosis in which a few striped muscle fibres could be distinguished. Section of the lung revealed the presence of broncho-pneumonia. Sections of the heart, liver, spleen and thymus were normal. The intestines showed a slight infiltration of Peyer's patches.

The microscopical diagnosis of the growth is therefore a Rhabdomyoma, showing adenomatous tissue in parts.

At several consultations participated in by Drs. Jacobi, Leale, Blumenthal, Brown, Thurman, Tompkins, and the writer, the question of operation was discussed. Though operation was inclined to be looked upon with favor by some of the participants in the consultations, among others the writer, it was finally decided not to subject the patient to an operation, inasmuch as the tumor had reached such a large growth that adhesions were probably very extensive and possibly dangerous to detach, as we were ignorant of the consistency and resistance of the point of attachment with the chance of causing secondary infection by disseminating the sarcomatous cells in case the attachments of the tumor were friable as they turned out to be in this instance, as the sudden withdrawal of so large a mass from the abdominal cavity might result in speedy death from shock and the rapid removal of pressure from the large intra-abdominal vessels as some

times happens after the operation of *paracentesis abdominis*, and as there was a possibility of a recurrence of the growth.

J. Bland Sutton, assistant surgeon to the Middlesex Hospital, London, in an article published in Vol. III. of the *Clinical Journal* (1894) says, "The removal of a renal sarcoma is a useless proceeding," basing his opinion on the results of twenty-one operations which he had collated. These operations were recorded by skilled operators in American, British, French, and German periodical literature. Of these twenty-one cases, nine recovered from the operation and twelve died from the results of the operation. The nine who recovered from the operation died within one year from recurrence and most of them within six months afterward. Although so eminent an authority as J. Bland Sutton has written thus, the most recent reports of cases of renal sarcoma which have been subjected to operation are much more favorable and warrant us to advise operation in these cases.

Among others a case almost exactly similar to mine is reported in the *Centralblatt für die Krankheiten der Harn und Sexual Organe*, Vol. XV., 1894, by Dr. L. Görl, of Nuremberg. The illustrations accompanying the report reproduce almost exactly the condition of affairs existing in my case, the right kidney also being the one affected in his case. Nephrectomy was performed eight months after the appearance of the first symptoms, and the patient had gotten entirely well eight weeks after the operation.

As has been said in an earlier part of this paper recourse was had to the treatment of the sarcoma by the injection of the toxin of erysipelas as introduced and advocated by Dr. R. W. Coley, of New York City, when it was definitely decided to forego operation. In the record of that method of treatment, as previously detailed, it will have been remarked that the reactionary fever always occurred sooner or later after the injection of the erysipelas toxin had been given. This was the only effect that was observed, its influence on the size or course of the growth or upon the general condition of the patient was

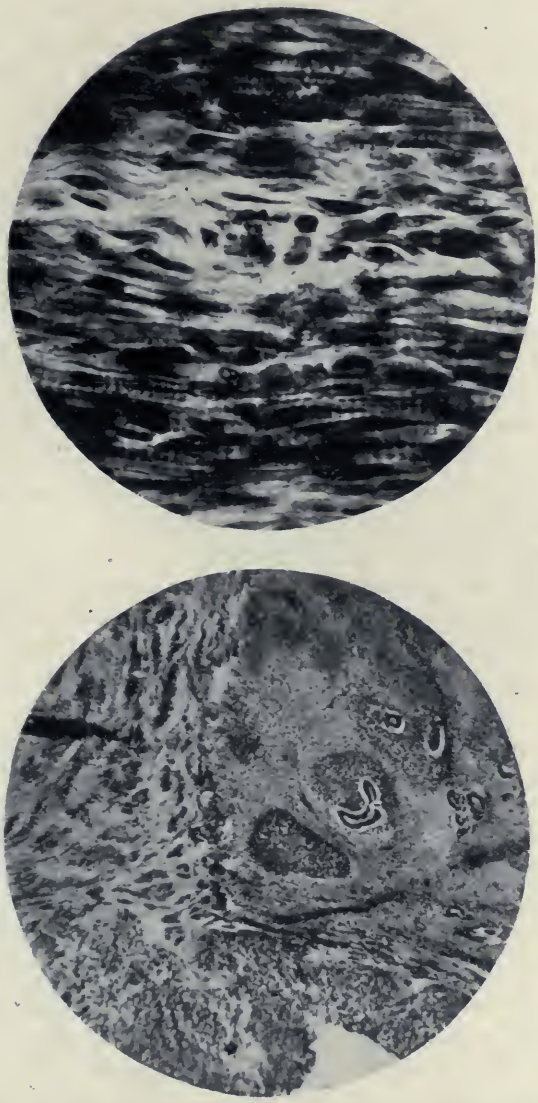


FIGURE 1. From photograph with oil immersion lens and with a magnification of 500 diameters, shows above and below masses of embryonic striated muscle cells in longitudinal section.

FIGURE 2. From photograph with 50 diameters magnification, shows adenomatous tissue to the right, striated muscle to the left and round cells below.

absolutely *nil.* In reviewing the cases recorded by Dr. Coley, in which he obtained successful results with his method, it will be observed that in all the cases the sarcomata were located externally as on the chest, back, clavicle, abdominal wall, palate, hand, sternum, breast, and so on, all locations accessible to treatment applied in the immediate radius of the disease. None of the cases reported are of internal visceral origin or attachment.

This may explain why the results have been so flattering in his hands. It is held by good men, Dr. A. R. Robinson among others, that any foreign substance injected into or near the substance of a sarcoma will be apt by setting up degenerative changes in the neoplasm to effect its cure and removal. It is plausible to assume that this is why the erysipelas toxin acts so favorably in sarcomata, which are external and accessible, and cannot act thus on visceral sarcomata because of their inaccessibility.

Renal sarcomata are tumors of very early life and are probably congenital; thus Windler reports thirty-seven cases, fifteen of which occurred in infants under two years old and five of these were under one year, whilst one case was met with in a fœtal kidney.* They are usually unilateral, yet sometimes bilateral. They are generally incapsulated and are composed of round and spindle-shaped cells, in which clusters of tubules occur. These tumors seldom invade the parenchyma of the kidney, being more frequently attached to the organ (usually to the capsule or pelvis), causing absorption and atrophy of its tissue. These tumors are nearly always of rapid growth.

In an article published by Dr. Paul Wagner, Dozent at the University of Leipsic, the principal symptoms indicative of a malignant tumor of the kidney are recounted in the order of their importance as follows:†

First and chiefly are the evidences of a hard, solid tumor or mass, having its attachment to the kidney.

Second, are the changes in the composition of the urine,

* Sarcoma of the Kidney, by Dr. B. C. A. Windler, *Journal of Anatomy and Physiology Normal and Pathological*, Vol. xviii. London. 1884.

† *Centralblatt fur die Krankheiten der Harn und Sexual Organe*, Band xv., 1894.

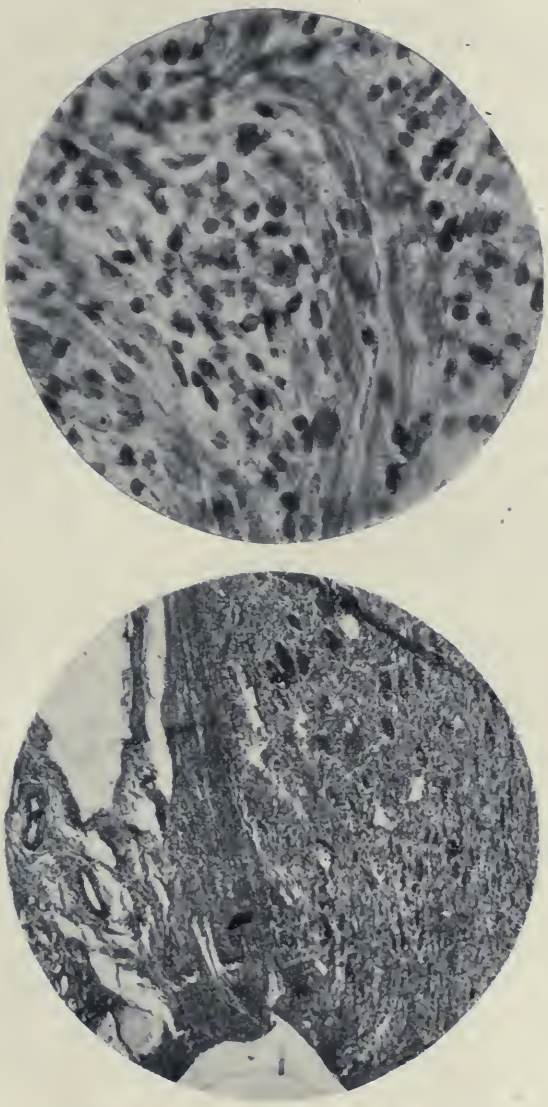


FIGURE 3. From photograph taken as in Figure 1, shows striated adult fibres irregularly arranged and mixed with cells of various shapes.

FIGURE 4. From photograph taken as in Figure 2, shows to the right diseased kidney tissue attached to a cystic portion of the tumor on the left.

particular stress being laid upon the presence of hæmaturia which was fully treated of by Dr. A. Seibert, our colleague, in *Das Jahrbuch für Kinderheilkunde*, Band xxi., published in 1884, and upon cellular elements of the tumor, which have been detected in the urine in exceptionally few cases indeed.

Third, is the presence of a progressive cachexia, most rapid in medullary carcinoma and round-celled sarcoma.

Fourth, is the subjective symptom of pain in the region of the kidney.

In closing, I can not refrain from alluding to the excellent article which was up to that time the most complete paper relating to the subject on primary sarcoma of the fœtal and infant kidney, read by our fellow-member, Dr. A. Jacobi, at the Eighth International Medical Congress held at Copenhagen in 1884, and in which attention was first directed to the differentiation between renal sarcoma and carcinoma.

161 WEST FIFTY-SEVENTH STREET.

DISCUSSION.

Dr. L. Emmett Holt: Dr. Fruitnight has overlooked two cases occurring in my service at the Baby's Hospital and operated upon by Dr. Robert Abbe, who has reported them in full. In one case the child was thirteen months old and the tumor weighed seven pounds. The child eighteen months afterwards was well. The second case, a child of ten months, was followed for sixteen months and was also still well. It seems to me that to conclude that such cases are not to be operated upon is to go against some excellent results attained. In one of Dr. Abbe's cases there was considerable shock, but the child made an uninterrupted recovery.

Dr. William Osler: The case reported in my Lectures on Abdominal Tumors remains well now more than two years after the operation. The tumor was very large and the child stood the operation remarkably well. I would ask Dr. Fruitnight in what respect he regards this tumor as unique histologically?

Dr. Fruitnight: The presence of unstriped muscle fibres.

Dr. Osler: Both striped and unstriped fibres may occur, as in the two cases which I reported shortly after Cohnheim's original communication.

Dr. A. Jacobi: The reason why the baby was not operated upon was that it was very much reduced in strength when we first saw it. One of the cases I published in 1884 was of the same description. I should agree with those more in favor of operating. Quite a number of cases have since been reported as having been successful. The sooner the operation is performed, the better. As a rule, for a long time only one kidney is affected and there are no metastatic deposits.

Dr. Fruitnight: Have any of the gentlemen present had any experience with the anti-toxin of erysipelas in the treatment of sarcoma?

Dr. Jacobi: I had the opportunity of using the blood of erysipelas, but not for a sufficient length of time. I used ten drops of blood from the cutis with twenty drops of normal salt solution injected every few days. The temperature would rise from 103° to 105° and remain at that point from six to eight hours. I only did this six or eight times when the erysipelas patient died, but during that time the sarcoma appeared to be getting smaller.

Dr. Fruitnight: In closing, I merely wish to put myself right in regard to the question of operating. I am not opposed to the operation; the gentlemen seemed to misunderstand me on that point.

A CLINICAL STUDY OF CASES OF ANGINA RESEMBLING DIPHTHERIA IN WHICH THE BACILLI ARE REPORTED ABSENT.*

BY E. M. BUCKINGHAM, M.D.

Boston.

Since the application of bacteriology to the study of diphtheria it has been questioned whether the cases in which the diphtheria (Klebs-Loeffler) bacilli are not found are really due to them or are cases of some other disease. There is nothing unreasonable in supposing them to be overlooked as is, we know, sometimes done, or that the membrane has outlasted the bacilli. It is also conceivable that there may be a disease of different etiology, but presenting identical appearances in the throat. It is, therefore, my purpose to study clinically the cases occurring in my last service in the diphtheria ward which were reported to be without these bacilli. In making this report I wish to express thanks to Dr. John L. Morse, who made many more examinations than the pathological department of the hospital had time for, who made clinical examinations of many of the cases, comparing notes with me afterward, and who in some instances visited patients' houses in search of information. No case referred to in this paper received the serum treatment, and all reported appearances in the mouth were recorded before the use of any local treatment.

There were a few cases in which bacilli were reported absent for a number of successive examinations, but in which they were afterward found. These may have become infected in the ward; but as we cannot know this to be true, none of them have been considered. There were twenty-four cases in which these bacilli were never found. Because of my then ignorance of the ease with which they may be overlooked, nine cases were insufficiently examined. These have been thrown aside and fifteen remain

* Published also in the Reports of the Boston City Hospital, Sixth Series, 1895.

to be considered. No case is retained in which there was not an examination on entrance, a second within two days, and a third previous to discharge. The number of examinations in individual cases ranges from three to nine. Cultures were made from more than one place at a single examination, as from both nostrils, both tonsils, the uvula, and the pharynx, but not all these regions were explored at a single examination. It is proposed to consider these cases with reference to temperature, vomiting, chill, pain, circulation, enlarged glands, coryza, condition of mouth, and length of stay in the hospital.

Perhaps it is not out of place to consider the normal temperature of diphtheria. Any kind of chart is sufficiently common in a diphtheria ward, but I believe that as a rule a high temperature means the presence of some complication. The temperature often rises with increasing dyspnœa. Patients occasionally have a certain rise, apparently from excitement when entering a hospital for any disease. Such a rise is generally of short duration. I have seen in a general ward temperatures of 102° and 103° in nervous children; due, I thought, to this cause alone, but these were extreme cases. Slighter rises from this cause are common with children. All the diphtheria records in Vol. 18 of the contagious service and the first half of those in each Vol. 19 and Vol. 20 have been studied. All cases were thrown out if there was a record of sepsis, consolidated lung, cough, otorrhœa, operation on the throat, or other evident cause for fever. After this was done the charts of the accepted cases were studied. There were sixty-seven such cases of uncomplicated diphtheria. In twenty-two the temperature did not reach 100°, and in fifteen more did not exceed it. Including these there were fifty-two cases of the sixty-seven in which the temperature did not exceed 101°, and fifteen in which it did. It reached 102° in thirteen cases only. In one of these the rise was apparently due to menstruation, while five were children in whom the second reading was 100° or lower, as were all subsequent readings. Of the remaining seven cases, one died the day after admission. In two the brilliant red of the throat suggested scarlet

fever, which was a common complication at the time, although these cases had no rash, and four times the temperature above 102° could be attributed to nothing but uncomplicated diphtheria. In one of these four the fall to 99° came on the second day and in the others sooner. It is possible that some cases with low temperature had a higher one at first, but that it fell before admission. I have a few private records of cases in which the bacilli were detected in which there was a rise, the maximum temperature being 102°, and the fall immediate. Some cases, with other diseases, developing diphtheria in the hospital have had a rise of a few degrees with the initial symptoms, but of short duration; others have had no appreciable rise.

Among the fifteen cases without bacilli, the temperature on admission was below 100° in five cases, did not exceed it in seven, did not exceed 101° in nine, and exceeded 102° in four cases. One of those below 100° was said to have had fever outside the hospital. There is no very remarkable difference in the percentage of these two series until we come to the higher groups. Of temperatures over 102° there were exactly as many in the one series of fifteen cases as in the other of sixty-seven, after making allowance for probable causes of disturbance. These probable causes of disturbance did not exist in the smaller series. The high temperatures remained high for from two and a half to four days after admission, six to ten days after initial symptoms.

The pulse is recorded as strong or good in thirteen of the fifteen cases, which is contrary to all my own experience in diphtheria, cases sick enough to be recognized having almost invariably weak, compressible pulses. Coryza existed in five cases; in three of them it was slight. Cervical glands were enlarged in thirteen cases; in some slightly, in some considerably. In two of the four cases with highest temperature, the enlargement was slight, and in another it was doubtful. All cases had membrane; that is what sent them to the hospital; sometimes it was little, sometimes much. Tonsils and uvula were sometimes swollen, sometimes not; sometimes reddened, sometimes

not. Tongue is reported red or coated with red edges in six cases,—nearly half the whole; but red is a comparative term, and while seeing the cases I had no suspicion of any such general redness. In one case, however, it is recorded as deep red, and in another as dark red with a thin film on the back. Redness is seldom mentioned in the records of the cases with bacilli, although their tongues are often described with some fulness. One throat is described as much inflamed, with little membrane; another, much swollen, with little membrane; another, much injected, with little membrane; another dark angry throat with little membrane; another, tonsils very much inflamed and swollen, with little membrane; another, throat injected with small patches on palate; yet another suggested follicular tonsillitis after the second day. Perhaps the rather general injection and swelling of the throat, together with little membrane in so many cases, and the presence of at least two highly reddened tongues, just suggest one of the acute exanthemata.

Vomiting occurred three times and nausea once, although but three of the patients were less than sixteen years old. But one of the children vomited, and in her case, as with one of the adults, this symptom was severe. Too much importance should not be given to this symptom or to chill, headache, or other pain, each of which was present in two or more cases; because, although they are of trifling importance in most diphtherias, although they bear no comparison to the same symptoms in other diseases, yet careful questioning will show that they do sometimes exist to some degree.

One of the patients had kissed his child four or six days before admission, she having at the time diphtheria with intubation and scarlet fever with desquamation. Two patients were nurses in the scarlet fever ward. One of them had never had scarlet fever, but had been in this ward for months. The other had been assigned to duty there but a few days before her sickness. Her previous history is unknown. At this time there were scarlet fever patients in that ward with diphtheria bacilli in their throats. A fourth patient was taken sick on the same day

with her sister, both having severe vomiting. The sister had very few bacilli on her first examination, although they increased rapidly.

One patient desquamated on the seventh day of the disease. She could have contracted scarlet fever in the ward where she had been five days, but if so it was without fever. In another, there was a suspicion of desquamation.

These fifteen cases of apparent diphtheria grouped about the single peculiarity of absent bacilli present as many high temperatures as more than four times as many cases in which the bacilli were found, and the temperature remained high for rather long periods. The heart was all but invariably, unusually strong for a diphtheria heart. There was on the whole an amount of redness and swelling in the mouth out of proportion to the membrane. Three of the fifteen patients are known to have been exposed to scarlet fever. Another case, otherwise one of the most suspicious with regard to temperature and vomiting, was taken sick on the same day as her sister, who had similar symptoms, and who had had very few bacilli at her first examination, this first examination being made in the diphtheria ward. One patient desquamated, he being otherwise one of the least suspicious in the group. In another patient, with much membrane and low temperature, there was a suspicion of desquamation.

Fifteen patients are a small number on which to formulate general rules. There is, however, perhaps some warrant for the strong suspicion, not certainty, that most of these cases were scarlet fever, with absence of or transitory rash. That the variations of scarlet fever are so innumerable adds force to the suspicion, as does the fact that that disease was very prevalent at the time. This suspicion was not entertained until the records were studied together, although I doubted these cases being diphtheria.

Three patients had traces of albumen in the urine. This is stated as a fact, not as throwing light on the question under discussion. All recovered. The longest stay in the hospital was thirty-six days. This patient was

retained long after she would otherwise have been discharged, because of a certain pallor of the tonsil, which may have been due to treatment, but which is seen after sore throats of all descriptions and all sorts of treatment. The next longest stay was twenty-two days, for desquamation. The next longest, seventeen days, was in a woman who furnished nothing to the composite picture of scarlet fever unless a record of red tongue be such. She had five negative bacteriological examinations. Another patient with five examinations was discharged on the fourteenth day. The other eleven patients went out in from three to seven days after admission.

The cases analyzed are Vol. 18, pp. 174, 224, 250, 252. Vol. 19, pp. 4, 72. Vol. 20, pp. 8, 114, 130, 166, 190, 230, 268. Vol. 21, pp. 14, 34.

Some of the bacteriological examinations are recorded only at the laboratory.

TETANUS OF THE NEW-BORN.*

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Premonitory symptoms of tetanus in the new-born are in many cases absent, or so slight as to escape notice. In some cases fretfulness precedes the attack, but no more than is often observed in those who continue in good health. The first symptom which alarms the parents and shows the grave nature of the commencing disease is inability to nurse, or evident pain and hesitation in nursing. Commencing with rigidity of the masseters, the disease gradually extends to the other voluntary muscles, and in the course of a few hours the muscles of the limbs as well as of the trunk are involved. Persistent muscular contraction, which is the pathognomonic feature of infantile tetanus, is developed not fully in the beginning, but by degrees in each affected muscle, so that it is not until after the lapse of several hours, perhaps even a day, that the greatest amount of rigidity is attained. Therefore in the commencement of the disease the limbs can be flexed and the jaw pressed open more readily than at a subsequent stage, though with manifest pain to the infant.

During the period of maximum rigidity the jaws are fixed almost immovably, often with a little interspace between them, against which the tongue presses and in which frothy saliva collects. The head is thrown backward and held in a fixed position by the stiffness of the cervical muscles. The forearms are flexed; the thumbs are thrown across the palms of the hands, and are firmly clenched by the fingers; the thighs are drawn toward the trunk; the great toes are adducted and the other toes flexed. Occasionally opisthotonos results from the extreme contraction of the dorsal and posterior cervical muscles. The infant can sometimes be raised without any yielding of the muscles by the one hand under the occiput and the other under the heels.

The rigidity is liable to variations in its intensity even after the full development of the disease. If the infant be quiet, especially if asleep, the muscles are partially relaxed to such an extent sometimes, in the first stages of the complaint, that the features have a placid and natural expression, though only for a short time. Frequent exacerbations occur in the muscular contraction, sometimes without any apparent cause, and sometimes produced by anything which excites or disturbs the child. Attempts to open the lips or jaws or eyelids or to bend the limbs, blowing on the face, and even the crawling of a fly upon it, occasion the paroxysms.

During the paroxysm the eyelids are forcibly compressed, as well as the lips, which are either drawn in or are pouting; the forehead and cheeks are thrown into wrinkles and the physiognomy is indicative of great suffering. The unnatural positions of the trunk and limbs which result from muscular contractions are increased for the moment; the head is more forcibly thrown back and the limbs more strongly flexed. The muscular movements which occur during the paroxysms are sometimes described as clonic spasms. There is indeed occasionally some quivering of the limbs, and yet, as I have on different occasions noticed, so far from the muscular action being a clonic spasm, it is clearly tonic and is intensified during the paroxysm. In fatal cases the paroxysms occur more and more frequently until the period of collapse.

The crying of the child affected by tetanus is never loud, however great the suffering. It is variously described by writers as "whimpering" or "whining." It is of this suppressed character in consequence of the rigid state of the respiratory muscles and their imperfect movement.

During the exacerbation respiration is suspended, or so imperfect and the circulation so retarded that the surface becomes of a deep red, almost livid, color. Sometimes epistaxis occurs, affording partial relief to the congestion, and sometimes, though less frequently, the blood forces itself from the congested liver along the umbilical vein and escapes from the umbilicus. The intense, passive congestion consequent upon the tetanic spasm is general

throughout the system, but extravasation of blood appears to be more common around the brain and spinal cord than elsewhere.

The frequency of the pulse and respiration varies in different cases and at different stages in the same case. They are often somewhat accelerated, but at other times are natural, or are even slower than in health.

While the appetite of the infant, to appearances, is not diminished, the pain which it experiences in nursing is such that alimentation is necessarily deficient. It can be fed with a spoon for a time after it ceases to take food in the natural way, but artificial feeding soon fails. The milk placed in its mouth is in great part pressed back through the violence of the spasm which is induced by the attempt to feed it.

In consequence of imperfect nutrition the infant rapidly wastes away. There is no other disease, except the diarrhœal affections, in which the emaciation is so rapid.

The condition of the intestines is not uniform. They may be relaxed, particularly if the disease be due to some irritation in them; in other cases the stools are natural or constipated.

It is often difficult to ascertain the state of the eyes, since attempts to open the eyelids bring on spasms and cause firm compression of the lids against each other. According to Sir Henry Holland, one of the first symptoms which occurred in cases on the island of Heimacy was strabismus, with rolling of the eyes. But this statement must be received with caution, since these cases were not seen by any physician and the information was obtained from the parents and priests. If true, the proximate cause of the disease in Heimacy would seem to be located in the cerebro-spinal axis. Contraction of the pupils commonly occurs in the stage of collapse.

Death in infantile tetanus may occur from apnœa in the paroxysms, from extreme congestion of the cerebral vessels, or apoplexy; and, lastly, it may occur from exhaustion. The last mode is probably the most frequent.

All writers, till recently, agree that tetanus of the infant rarely terminates favorably. Cullen attributes the igno-

rance of physicians in regard to this disease to the fact that it is so little amenable to treatment that they are not usually summoned to attend those affected with it. In the island of Heimacy, of 185 cases occurring during a series of years about the commencement of the present century, not one survived; and in the same locality, at Westmannoe, a small islet, 64 per cent. of all the infants born died of trismus.

Yet death does not always result: eight of the forty cases in my collection recovered; but a correct opinion cannot be formed from this of the actual ratio of favorable to unfavorable cases, since favorable cases are much more likely to be published. In the history of these eight cases two interesting facts are noticed, which, when presented, may serve as a ground for hope of a successful termination. These were, the age at which the disease began and the fluctuations of the symptoms. With two exceptions, the infants who recovered were about a week old when the initiatory symptoms appeared, and there were fluctuations in the gravity of the symptoms; whereas fatal cases ordinarily grow progressively worse. Yet in favorable cases the symptoms are never so severe as they become in a few hours in those who succumb.

Of eighteen cases observed by Finckh in the Stuttgart Hospital, fifteen died in two days, two in five days and one in seven days. During the epidemic in the Stockholm hospitals in 1834, where forty-two cases were treated, the disease seldom lasted more than two days. Romberg says: "It generally lasts from two to four days, but its duration is at times limited at from eight to twenty-four hours, and occasionally, though rarely, it extends from five to nine days.

In thirty-one fatal cases in my collection in which the duration is mentioned,

1 lived.....3 hours.
11 others lived.....1 day or less.
12 lived.....2 days.
4 lived.....3 "
3 lived.....4 "

Both Underwood, who published a treatise on diseases

of children in 1789, and Dr. Elsässer at a more recent date, recorded fatal cases which were unusually protracted. The one described by Underwood was treated in the British Lying-in Hospital, and, although all the others treated in this institution died by the third day, this lived six weeks; but it is suggested by the author that death was due in part to some other affection. The child treated by Elsässer lived thirty-one days.

In the eight favorable cases in my collection the duration of the disease, reckoned from the time when the infant ceased nursing till it began again, was as follows: In one case, two days; in one, a few days; in one, fourteen days; in two, fifteen days; in one, twenty-eight days; in one, twenty-one days; and in the remaining case, about five weeks.

To one who has seen this disease in the new-born or is familiar with its symptoms a diagnosis is easy. The symptoms which possess diagnostic value are more manifest and reliable than in most other infantile maladies. Permanent rigidity of the voluntary muscles, with temporary exacerbations, such as have been described above, which are induced by any cause which disturbs the infant, as attempts to open the mouth or eyelids, is pathognomonic.

Let us stop for a moment and consider the facts related above which have a bearing on therapeutics:

(1) With possibly a few exceptions tetanus, whether occurring in man or animals, whether in the infant or the adult, is the same disease, and is caused by the entrance into the system of a rod-shaped microbe two or three times the length of the tubercular bacillus. One end of the bacillus is somewhat rounded, so as to give it a pin-shape, and is enlarged by the presence of a spore.

(2) The tetanus bacillus, as stated above, thrives most luxuriantly, and probably is most virulent where dirt and filth abound. We have said also that its natural home is the soil, and not so much the virgin soil as soil which is rendered impure by the proximity and drainage of barnyards, and especially horse-stables.

(3) Of the domestic animals, the horse and, to a less degree, the sheep are liable to tetanus, and hence those

who are exposed by their occupations to these animals or to the soil infected by their excretions are more liable to tetanus from injuries, even from slight bruises or wounds, than are those whose occupations do not bring them into constant contact with these animals or with infected soil.

(4) We have stated that the bacillus of tetanus is widespread, so that this disease occurs in every climate, from the Arctic regions to Demerara or Bombay. But this bacillus, like that of diphtheria, has remarkable vitality and power for propagation, so that it has continued for an indefinite time to survive and multiply in certain localities, as in parts of Long Island, notwithstanding constant tillage.

(5) As regards tetanus neonatorum, the observations which I have related show beyond doubt that in most instances the specific bacillus obtains entrance into the system through the umbilical blood-vessels and lymphatics, and within these vessels the toxin described and analyzed by Brieger and others, and which is so fatal, is produced.

While tetanus neonatorum, if fully developed, is ordinarily fatal in spite of any remedial measures heretofore used, there is no doubt of the efficacy and value of preventative measures when properly employed. This was shown by the great reduction in mortality in the Dublin Lying-in Hospital through the thorough ventilation introduced by Dr. Clarke. Dr. Meriwether, of Montgomery, Ala., says: "When the disease appears endemically on a plantation it may be arrested by having the negro houses whitewashed with lime inside and out; by raising the floors above the ground; by removing all filth from under and about the houses; by particular attention to cleanliness in the bedding and clothing of the mother and in the dressing of the child, so as to prevent any of the matter from the umbilicus lying long in contact with the skin." Many physicians, especially in the Southern states, speak confidently of care in dressing the cord and attention to the umbilicus as a means of preventation. Graften says that he has "never known the disease to occur in any child whose navel had the turpentine dressing." He uses turpentine as follows: "At the first time a few drops of un-

diluted turpentine are applied immediately to the umbilicus around the cord, and it is anointed at every succeeding dressing, the turpentine being diluted one-half or two-thirds with olive oil, lard, or fresh butter." This use of turpentine has also been recommended by other practitioners in warm regions.

Dr. John Furlonge, of St. John's, Antigua, believes that no case would occur with the following treatment: "The cord, when divided, should be wrapped in clean linen. Every night for two weeks one or two drops of tinct. opii and spts. vini, equal parts, should be given, and castor oil, with a little magnesia, every morning. The child must be washed in tepid water every morning and the funis dressed." If this treatment be attended by the success which is claimed for it by Dr. Furlonge, so great care in dressing the cord is certainly well repaid in localities, as at Antigua, where a large proportion of the infants die of tetanus. But since it is now known that tetanus neonatorum, like that at a more advanced age, usually has a microbic origin, an antiseptic and germicide dressing of the cord is evidently preferable, as by filling the umbilicus and dusting the cord with aristol.

Some experienced observers go so far as to assert that it is possible to ward off tetanus neonatorum after the occurrence of premonitory symptoms. Dr. Dowell says: "Some with slight twitchings of the muscles have recovered without any trouble by being put into a mustard-bath, washed clean and put in a clean and well-ventilated cabin."

In considering the effects of medicinal agents which have been employed in the treatment of infantile tetanus, the great difficulty which the child experiences in swallowing should be borne in mind. Without care a considerable part of the dose is lost by the spasm of the muscles of deglutition, which ordinarily occurs when the spoon is placed in the mouth, so that, unless special attention be given to this matter, it is uncertain whether the prescribed dose is fully administered.

The treatment employed by different physicians has been very diverse. Antiphlogistic remedies were prescribed

by Finckh, but every case so treated was fatal. He states that whenever blood was abstracted, even in small quantities, the symptoms were aggravated. The same result has followed depletory measures in the practice of other physicians. The internal remedies which have been most frequently prescribed are opiates and antispasmodics. Furlonge, in a favorable case, gave laudanum in doses of one drop every three hours alternating with two grains of Dover's powder. Woodworth also gave one-drop doses of laudanum; Eberle, one-sixth of a drop hourly. The opiate has generally been given in combination with an antispasmodic. The Dover's powder given every three hours by Furlonge was combined with five grains of sulphate of zinc. The hourly doses of laudanum by Eberle were combined with six drops of tincture of asafœtida.

When anæsthetics began to be employed in the treatment of diseases it was believed that they would be especially useful in cases of tetanus. Accordingly, chloroform has been used in tetanus in the infant, with the effect of controlling the spasm during the time of its use, but without curing the disease. Anæsthetics certainly relieve the suffering of the infant, and on this account, even if they do not prolong life, their judicious employment seems proper.

The remedy which has been more efficient than those mentioned above has been the hydrate of chloral, given with or without one of the bromides. Since the introduction of this agent into therapeutics it has been employed by several physicians in the treatment of this disease with so good a result that it will probably supersede all other medicines for this purpose. Dr. Widerhofer, of Vienna, states that he has saved six out of ten or twelve by the use of chloral. He prescribes it in doses of one or two grains by the mouth, or, if there be great difficulty in swallowing, two or four grains by the rectum. Dr. F. Auchenthales relates a case in which he gave even six-grain doses, and in nine days the disease had entirely disappeared. I have recently employed hydrate of chloral in a case of tetanus, giving it in half-grain or one-grain doses every two hours, except when there was profound

sleep. The disease was fully developed and the symptoms severe when I was called. I did not believe that the infant, with the old remedies, would live more than two days, but by the use of chloral life was prolonged nearly one week. Moreover, by the use of chloral the suffering of the infant is greatly diminished. The frequent inhalation of sulphuric ether also aids materially in controlling the spasms. The administration of alcoholic stimulants is required at short intervals on account of the rapid emaciation and great prostration.

Local treatment directed to the umbilicus in those cases in which there is evidence of inflammation of the umbilicus or umbilical vessels should not be neglected. The application of an emollient poultice to the umbilicus has been followed by apparent improvement, if we may believe the statement of some physicians who have made use of this treatment. Dr. Meriwether, of Alabama, says if there be no improvement from the medicine which he orders he applies a blister, larger than a dollar, to the umbilicus, and with this treatment the child generally improves—a remarkable statement, since so few improve at all.

No one can fail to observe the need of early and continuous antiseptic treatment of the umbilicus, as in septicæmia. Aristol, iodoform, boracic or salicylic acid should be constantly and as deeply applied in the umbilical fossa as possible, mixed with a liquid, perhaps glycerin, to make it penetrate more deeply.

A warm foot-bath, repeated at intervals of a few hours, and stimulating embrocations along the spine, are proper adjuvants to the treatment.

The apparent encouraging results of the treatment of diphtheria by the subcutaneous injection of the serum of an animal rendered immune to this disease by repeated inoculations led to observations and experimentation to determine whether a similar treatment might be useful in tetanus. We have seen how the bacillus of tetanus can be propagated and obtained in the flask of the chemist, and it is easily communicated to the horse by inoculation. Tizzoni and Cattani, followed by others, have employed the antitoxin treatment of tetanus. It is obviously best,

in order to determine its efficiency, to learn the results of its use, whatever the age, for it is the same disease in infancy, childhood, and adult life.

Escherich reports four cases of tetanus neonatorum treated by Tizzoni's antitoxine. The following are the statistics of these cases: In the four cases the umbilical cord was detached on the sixth, third, fourth, and fourth days; the incubation was two, nine, one, and seven days; the duration, two, five, two, and twelve days. The fourth or last case only recovered. In all who died septic inflammation of the umbilical cord was present, and all exhibited septic symptoms. A little of the tissue at the umbilicus, taken from the bodies of the first and third cases and inoculated in mice, caused tetanus in them. In Case 1, (fatal) only 0.015 by 2.0 of antitoxic serum was injected; in Case 2, (fatal) the injections of 0.25 were discontinued on account of the occurrence of septic pneumonia; in Case 3, (fatal) the tetanus was exceptionally severe, so that a good result could not be expected. In the case that recovered an injection (0.3) was given on the third and twice on the fourth day.

In the *British Med. Journ.*, January 19, 1895, the case of a man is related who was injured by a catapult and six days afterwards began to have tetanic symptoms. The wound was half an inch below the symphysis of the lower jaw and gave rise to a foul discharge containing shreds of string and shoemaker's wax. Trismus, inability to open the mouth, prominence and rigidity of the muscles of the neck and back followed. The symptoms gradually increased, and on the third day of the tetanus 2.5 grammes of Tizzoni's antitoxin, in sterilized distilled water, were introduced by punctures in the abdominal walls. Each puncture was painful and was attended by strong opisthotonic spasms. On the following day, October 7, or fourth day of the tetanus, 1 gramme (fifteen grains) was injected. On each of the following days, October 8, 9, 10, 11, 12 and 13, either one-half or one gramme (seven and one-half or fifteen grains) was injected, but none was used on the 15th. On October 16 his tongue was caught between the teeth and could not be released by the attendants. Vio-

lent and almost continuous spasms followed, with laceration of the tongue and great dyspnœa. When the patient appeared to be dying, grain $\frac{1}{60}$ of physostigmine and grain $\frac{1}{2}$ of morphine were injected, and in less than a minute the masseters were so relaxed that the lacerated tongue was released and the lividity, dyspnœa and violent opisthotonic spasms ceased. On this eventful day the antitoxin was not employed, so that forty-eight hours elapsed without its use. On October 17, 18 and 19 one gramme each day was administered and on October 20 half a gramme. From this time the patient steadily improved.

Mr. Marriott, who reported the above case, summarizes the treatment as follows: "Antitoxin, with the exception of the three injections of the physostigmine and morphine, was the only remedy used in this case, as, though chloral was at first prescribed, only a very small quantity was swallowed. The patient certainly seemed much relieved by the treatment, and it is to be remarked that the severe and nearly fatal relapse occurred after the diminution of the dose on October 14 and its suspension on October 15. He states also that the two injections of physostogmine and morphine when given together had a most salutary effect in diminishing the spasms.

In the same number of the *British Med. Journ.* a case is related better adapted to our purpose, for it is one of tetanus neonatorum treated with tetanus antitoxin, reported by Mr. Firth. The infant was born on September 18, 1894, and after ligation of the cord the navel was dressed with a clean piece of linen. On the sixth day it was dressed with a scorched piece of linen soaked in castor oil. On the eighth day the infant was fretful and took the breast with difficulty. On the eleventh day after birth or fourth of the disease it was admitted into the Bristol General Hospital, and on the fifth day of the disease it was more carefully examined. It was icteric; its eyelids tightly closed, the conjunctivæ could not be seen; the face was wrinkled; no risus sardonicus; masseters hard; lower jaw rigidly fixed; head slightly retracted; neck and spine very rigid; arms and forearms adducted and rigid; fingers firmly flexed into the palms, and thumbs firmly flexed

over them; it swallowed with great difficulty, and became cyanotic when a little milk was placed in the mouth; spasms, lasting three or four minutes and beginning and ending gradually occurred; temperature normal or slightly subnormal; pulse 128, resp. 36; chloral hydrate gr. ½ and potas. bromide, gr. 1 to 2, were administered every four hours.

On the sixth, seventh and eighth days no improvement occurred, but spasms of tonic muscular contractions severe, and attended by cessation of respiration and very frequent, weak, or inappreciable pulse were present. At one time it was thought to be dead. On the eighth day of the disease the tetanus antitoxin was employed, six grains being injected under the skin of the abdomen in five places. On the ninth day a similar injection was made at 4 P.M., and the third at 8.30 P.M. On the tenth day the patient had eight of the spasmodic attacks of muscular rigidity lasting from five to fifteen minutes, and the longest suspension of respiration in the attacks was seven minutes. A last injection of twelve grains of tetanus antitoxin was made at 1 P.M., and death occurred at 8 P.M.

It will be seen that the infant had four injections of the antitoxin, two grammes or thirty grains in all, without any appreciable controlling effect on the tetanus.

From the above cases, and from others of a similar nature which have been published, it appears that the tetanus antitoxin, in order to be efficient, must be used early, and more observations are required in order to ascertain what power it possesses in the treatment of tetanus even at an early stage. The tetanus antitoxin, like that of diphtheria, is still on trial, and many more observations will be required before its efficiency is determined. With or without this new remedy it is evident that the hydrate of chloral, with perhaps one of the bromides, should still be employed.

The method of preparing and using the antitoxic serum is as follows: The toxin employed for immunizing the horse is prepared in a flask containing grape-sugar bouillon and hydrogen, in the manner described by Mr. Hewlett, which I have already related. The toxin of tetanus

prepared in this manner in the flask of the chemist is such a powerful poison that in employing it to immunize the horse by subcutaneous injections it is first diluted by admixture with an equal quantity of Gram's iodine solution. Hewlett in immunizing the horse employed three injections weekly, beginning with .5 c.cm., and gradually increasing to 8 c.cm. or 10 c.cm. from May 2 to June 22, after which Mr. Hewlett gradually diminished the diluent until the pure toxin was employed on and after July 2, but sometimes with dangerous symptoms. "On July 25 4 c.cm. were injected into the jugular vein, followed by rather alarming symptoms half an hour after, the animal falling prostrate with legs extended, labored respiration and rapid small pulse." The animal recovered in ten minutes. As in preparing the diphtheritic antitoxin, the horse should receive these injections about three times weekly for three to six months, but before immunized serum is placed in the hands of the physician or pharmacist it should be tested upon animals.

Mr. Hewlett writes in reference to the antitoxic serum of the horse properly prepared as follows: "Experimentally, the effects of the antitoxin are little short of marvellous. Minute doses injected into animals will completely neutralize fatal doses of the tetanus toxin injected eight or twelve hours afterward. Mixtures of the toxin with the antitoxin serum in proportions of forty or fifty parts of the former to one of the latter are completely inert, and two cubic centimetres of such a mixture, containing nearly 2 c.cm. of the deadly toxin, may be injected into a guinea-pig without producing any effect. The antitoxin also possesses considerable curative power, but much larger doses are necessary when the disease has declared itself than when used as an immunizing agent."

"The antitoxin treatment of tetanus would seem to be the one which gives the best hope of cure. . . I have been able to collect records of forty-two cases of tetanus treated with antitoxin, nearly all traumatic, and of these fifteen died and twenty-seven recovered, giving a mortality of about 36 per cent."

TYPHOID FEVER IN CHILDREN UNDER TWO YEARS—IS IT FREQUENT?

BY W. P. NORTHRUP, M.D.

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New York.

This communication was intended to open and call forth a discussion upon the above subject. On account of the absence of the writer the title of the paper was presented and there was no discussion. A few facts forming the basis of the proposed paper are here presented.

Typhoid fever is a disease to which there is little susceptibility in children under two years. In epidemics children, under two years of age, though naturally little susceptible, may by the presence of an overwhelming poison succumb to typhoid fever.

As to the occurrence of typhoid fever in children under two years as ascertained from hospital records, reports have been obtained from the following hospitals: New York Foundling Hospital, New York Infant Asylum, Philadelphia Children's Hospital.

The New York Foundling Hospital, being the largest, is put first. There is no record of typhoid fever in a child under three years of age in a period extending back rather more than twenty years. The records are vouched for and corroborated by the personal experience of Drs. J. Lewis Smith and Jos. O'Dwyer. My own experience as pathologist and attending physician covers a period of thirteen years and includes two thousand autopsies on children under five years of age. It may be added that the institution from which this experience was gained has continuously eighteen hundred children under its care varying in age from one day to three and five years. Of this number eleven hundred are "out boarding" up

to the age of three years. They are distributed about New York City, Staten Island, and all the cities and towns in the immediate vicinity of New York, including Jersey City, Hoboken, Williamsburg, Astoria, Brooklyn, and Westchester County. When any of these "boarded out" children are taken sick, they are at once brought to the hospital and remain till restored to health. It is clearly evident that this is a wide distribution of children. The ten-dollars-a-month nurse does not enjoy especially hygienic surroundings, and from these same districts adults suffering from typhoid are frequently finding their way to general hospitals of the city, not a few of whom have come under my personal care in three successive Septembers and Octobers at the Presbyterian Hospital. Furthermore, Dr. O'Dwyer and myself discussed the absence of typhoid fever at the Foundling Hospital ten years ago and have literally been looking for it ever since.

Non-epidemic typhoid fever cannot be of frequent occurrence in children under three years of age, or these eleven hundred children, sprinkled over a large area where typhoid fever is known to exist sporadically, must have brought home to the hospital at least one case in thirteen to twenty years.

Dr. Henry Page, Jr., Resident Physician of the Children's Hospital of Philadelphia, in a pertinent letter placed at my disposal by Dr. Wm. B. Noyes, writes as follows:

"I received your letter this morning and I surely thought I could give you several cases of typhoid under three years, but upon examining the records I find that no such case has occurred since histories have been kept in this hospital. I have had from six to ten typhoids in children in the house ever since I came on duty here, but not one of them was under six years. This fact may be of use to you, however, as a proof of the rarity of the disease in patients so young. This is said to be the largest children's hospital in America, and yet in recent years not one typhoid below three years has been admitted."

Dr. Charles G. Kerley, formerly Resident Physician of

the New York Infant Asylum, writes: "During my four years' term of service at the New York Infant Asylum, Mt. Vernon, New York, thirteen hundred and twenty-six children came under my care. Of these ninety-five per cent. were under five years of age, and eighty-five per cent. were under two years of age. Four hundred and ten died, upon all of which autopsies were made and not once were the lesions of typhoid found. There never was a case of typhoid at the asylum during my service."

Dr. S. K. Bremner, the succeeding resident physician at the New York Infant Asylum, in an oral communication, reported a similar experience. His three years service with Dr. Kerley's makes seven consecutive years' experience in a very large institution. Dr. Bremner reports that in his service of three years there was no case in the institution on which, from the clinical observations, or from clinical observations and autopsy, one could justify a diagnosis of typhoid fever.

The reports of the Children's Hospital of Boston, from 1869 to 1894, shows that forty-two cases of typhoid fever were treated. There was no case under three years, but one under four years, and five under five years. The oldest patient was twelve years.

From the testimony of these three large hospitals the statement would seem justifiable that typhoid fever occurring sporadically in children under two and even three years is rare.

TWO CASES OF TETANY.

BY FLOYD M. CRANDALL, M.D.

New York.

It is not my intention to enter upon an extended discussion of tetany. Although two of our members, Dr. J. Lewis Smith and Dr. J. P Crozier Griffith, have written most scientific and complete papers upon the subject, it has not been presented before this society. I venture to report, therefore, two cases which have recently come under my observation.

The first case presented striking features and decided peculiarities. I was for some time in doubt as to whether it was in reality a case of tetany. Although it presented many anomalous features, symptoms gradually developed which were characteristic of that disease. Dr. Griffith in his admirable paper published in the American Journal of Medical Sciences in February of this year, gives the following definition:—"A disease consisting of tonic spasms either continuous or paroxysmal; usually symmetrical; affecting especially the extremities, but often widespread or sometimes confined to one limb; not accompanied by unconsciousness and not depending upon any irritating lesion of the brain, cord, or nerves, or upon hysteria." This definition clearly describes my cases.

The first patient was a boy whom I first saw on June 28th, 1893. He was then two weeks old and was suffering from severe colic. The attacks of colic were repeated in milder form occasionally during the summer, but he had at no time a convulsion and was an ordinarily healthy child.

I next saw him on December 22d, 1893, he being then six months old. He was suffering from bronchitis of a rather severe type and green watery diarrhœa. The mother remarked that for two or three days the baby had developed a peculiar habit of occasionally staring at her in a vacant way. One week later the bronchitis had much

improved and the diarrhœa had disappeared. The peculiar stare which the mother had noticed had become more frequent and pronounced. Five or six times during the day the staring expression would be noticed, but would immediately pass away. For a day or two there had been slight twitching of the extremities.

On January 19th, four weeks after the first symptoms had been noticed the bronchitis and cough had entirely disappeared. There was slight constipation, but no marked evidence of indigestion. The nervous disorder had, however, steadily increased. The paroxysms were occurring six or seven times a day and were severe. The patient was referred to Dr. Landon Carter Grey. He found no evidences of organic lesion nor of nephritis or kidney disease of any kind and no indican in the urine, for which he looked with especial care. As there was slight adherence of the prepuce he advised its correction, and after this was done to await results as he found no other probable exciting cause.

On January 23d I saw the child in a paroxysm. The first symptom appeared in the eyes which showed a fixed stare, the pupils being slightly dilated, equally and evenly. Quickly following this was the appearance of general convulsive movements, affecting the extremities chiefly and the face but slightly. The arms were drawn closely to the sides and the hands were swung around across each other. The wrists were strongly flexed and adducted. The fingers were bent at the metocarpo-phlangeal articulation, but were extended at the other joints. The thumb was flexed into the palm and the index and little fingers were drawn more strongly inward, giving the hand a very peculiar cone-shaped appearance. The legs were adducted and the feet extended, causing the instep to arch over in a typical carpo-pedal spasm. The tension over the instep was extreme. The head was drawn somewhat forward, the muscles of the neck standing out rigidly.

The spasm was tonic in character, being somewhat remittent. There were seven or eight distinct paroxysms, each being more severe than the preceding, with a slight relaxation between them. There was no *complete* relaxa-

tion during the paroxysm which lasted one and one-half minutes or possibly longer. The child was certainly not unconscious. Near the height of the paroxysm there was a slight whimpering cry as if from pain. The respiration was somewhat labored and seemed to render a full cry impossible. The tension of the instep and intense contractions of the wrists were certainly sufficient to cause pain. The spasm when it had reached its height relaxed rapidly and the child at once recovered itself and in two minutes appeared perfectly well. He never at any time showed a tendency to sleep after a paroxysm.

The attacks almost invariably occurred just as the child awoke from sleep, though the mother thinks that he was sometimes awakened by them. A record of their exact occurrence was kept for eleven days. They never occurred less than five or more than eight times in twenty-four hours, the usual number being six or seven. They were not grouped but were distributed very evenly throughout the day and night. With but few exceptions they did not occur at intervals of less than two hours or more than six hours. For a short time after this they occurred very frequently during the night. There was usually a little attempt at crying during the height of the spasm. There was no incontinence either of fæces or urine so far as is known. The child was more cross and fretful than usual, but not extremely so.

The symptoms were of course referred by the friends to dentition, but the gums showed nothing abnormal. The first tooth appeared early in June when the child was exactly one year of age, while the most serious convulsions occurred in January. The prepuce was very readily retracted. There was slight adhesion on one side which was readily overcome, but there was but little secretion underneath. The record shows that for several days before and after this operation there was no change either in the frequency or character of the attack. Examination of the ears, throat, and nose showed no source of irritation. There was no hernia. There was at no time any elevation of temperature except during the first week when there was bronchitis and diarrhœa. The child

showed distinct but rather mild evidences of rickets. The epiphyses were slightly enlarged and there was beading of the ribs. I could not detect craniotabes. There was slight but not excessive sweating of the head. I heard at no time any stridulous cough or anything which could be considered laryngismus stridulus and was unable to obtain any history of such a symptom.

On January 30th there was no material change except that the child seemed a little brighter. The paroxysms had continued unchanged in number and character, although I had given bromide of sodium in daily doses of ten grains. The child had shown for two weeks a strong tendency to constipation. There was occasional distension of the abdomen with slight flatulence. I had devoted considerable attention to the digestion, but was not as rigid, perhaps, in directions as I might have been. The child was breast-fed and received no other diet. The mother was of very nervous temperament and became exceedingly nervous as the child's symptoms increased. Examinations of the breast milk showed it to be of fair color and appearance. The specific gravity averaged 1030 and the cream five and one-half per cent. Nursing had been very irregular. I had found it difficult to induce the mother to nurse regularly, as she dreaded to awaken the child when asleep, fearing a convulsion. I now laid down rigid rules as to the hours for nursing and directed my attention wholly to the digestion, including regulation of the mother's diet and digestion. The bromide was stopped and after each nursing six drops of rhubarb and soda mixture and one drop of fluid extract of cascara were given. On February 3d, four days later, the bowels were not materially loosened. I gave for two nights small doses of calomel and increased the cascara. The bowels soon became regular. On February 9th the number of paroxysms had decreased; on the 10th there were two; on the 11th there was none. Since that date to the time of writing, fifteen months, the child has been continuously well and has had no recurrence of the convulsions. Dr. Grey, to whom I reported the progress of the case, wrote: "It is one of the most conclusive cases I have ever met,

and I cannot resist the conviction that there must have been some intestinal product causative of the convulsions." Except for the constipation which was persistent after the diarrhœa ceased, but was at no time especially obstinate, the child did not show any marked degree of digestive disturbance. There was some acidity of the stomach at times, though rarely any regurgitation or vomiting of food. As the case progressed the evidence of intestinal derangement was shown more clearly by increased flatulence. Until late in January these symptoms were not more marked than one sees constantly in practice. I cannot resist, however, the conclusion that the disturbance was due in large part, perhaps wholly, to some intestinal fermentation. I am well aware that such symptoms sometimes disappear as quickly and with as little apparent reason as they developed, and am not inclined to attribute over-much to the treatment. Relief of the flatulence and constipation was, however, coincident with the disappearance of the paroxysms.

The second patient was an Italian boy one year old. He was brought to the Polyclinic on March 12th. He had been an ordinarily healthy child until three weeks before when he began to have convulsions. These had increased in frequency and during the past day or two had occurred at intervals of one or two hours. He was seized with a convulsion while in the waiting room and was taken before the class. The convulsion, however, had ceased, but after a few minutes he suddenly had a distinct but not severe paroxysm of laryngismus stridulus. The attack was short and consisted of three loud, stridulous inspirations which could be heard in the next room. The pupils of the class at once made a diagnosis of croup. While discussing the case, the child made another somewhat suppressed stridulous sound and went into a convulsion which lasted for about two minutes. The face was slightly affected, the muscles about the mouth being chiefly involved. The jaw was closed and the muscles at the corners of the mouth were drawn, giving a ghastly, grinning expression. The arms were drawn to the side in a series of remitting paroxysms increasing in severity.

The fore-arms were drawn across the front of the body, the wrists were strongly flexed, and the fingers were flexed at the metacarpo-phalyngeal articulation. The hand did not assume as distinct a cone-shaped appearance as occurred in the first case. The legs were extended. The toes were strongly flexed, the instep being rounded over and the foot as a whole being adducted so that the toes were drawn against and across each other. The general position of the child was more that of extension than in the first case, but there was no opisthotonos. As the paroxysm relaxed there were a few faintly stridulous sounds, but no actual laryngismus. The child immediately recovered and appeared to be in a perfectly normal condition. When I saw him fifteen minutes later he was vigorously gnawing the end of an enormous baker's bun. He had another paroxysm soon after and went away lamenting the loss of his bun, which had been taken from him. The child's attention at this time seemed to be devoted about equally to his paroxysms and his baker's cake. He was breast-fed, but was freely fed, also, from the table. He gave a history of indigestion and vomiting with the bowels alternately relaxed and constipated. He was markedly rachitic, but no craniotabes could be detected. A brisk cathartic was prescribed and strict rules regarding his feeding were laid down. During the next twenty-four hours the child had over twenty convulsions. They then rapidly diminished in frequency and had ceased at the end of two days. There had been no recurrence at the end of two weeks when he was last seen. The laryngismus also disappeared with the convulsions.

ON THE ASSOCIATION OF ENORMOUS HEART HYPERTROPHY, CHRONIC PROLIFERATIVE PERITONITIS, AND RECURRING ASCITES, WITH ADHERENT PERICARDIUM.

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Recurring ascites is a not very uncommon incident in the chronic heart disease of children and adults. It is seen most frequently in mitral valve lesion with consecutive changes in the liver, due either to the atrophy, consequent upon the cyanotic induration, or in adults to an associated alcoholic cirrhosis. There are instances also in children, in which the ascites is due to another cause; namely, a chronic proliferative peritonitis with extensive peri-hepatitis and peri-splenitis.

Some eight years ago there was admitted to my wards at the University Hospital, Philadelphia, a boy aged thirteen, with a history of recurring attacks of ascites. He had a very greatly enlarged heart, and a loud apex systolic murmur. He was under observation for a long time, and was tapped repeatedly. The dropsy was limited to the peritoneum, and we regarded the case as one of old mitral valve disease, with secondary cirrhosis of the liver.

The autopsy showed, somewhat to our surprise, an adherent pericardium, an enormously enlarged heart without valve lesion, a chronic proliferative peritonitis, with peri-hepatitis and peri-splenitis. The case was unique in my experience, and remained so until a second case came under my observation, the notes of which I give here in more detail.

The patient, with the exception of a few months during the summer of 1891 and 1892, was in Ward G of the Johns Hopkins Hospital from May 14th, 1891, to December 8th, 1894, a period of more than three and a half years.

Louisa R., age on first admission eleven years; at the time of her death, fourteen.

Previous History.—There was no history of acute rheu-

matism or of St. Vitus's dance. She had had measles, scarlet fever and whooping-cough. On questioning the mother closely about rheumatism, she says that Louisa had at one time growing pains in the legs, and the muscles of the right arm were once so stiff that she could scarcely use it. The joints, however, were never swollen or tender.

Onset of Illness.—About May 1st, 1891, she began to have shortness of breath, with swelling of the feet and of the abdomen. Nothing abnormal had been noted before this time. On her first admission there was orthopnoea, general anasarca, cyanosis, and extreme ascites, so that she was tapped at once, and over three litres of clear fluid were withdrawn. There was enormous hypertrophy of the heart, with great bulging of the praecordia. There was no thrill, but there was a very loud blowing systolic murmur at the apex, rough in quality, and transmitted to the spine. The murmur was heard also at the lower sternum and at its left margin. The pulmonary second sound was accentuated.

The child improved a good deal, and the œdema of the feet disappeared, but the swelling of the abdomen persisted. The spleen could be felt below the costal margin; the liver was enlarged, the edge only one inch from the transverse navel line.

The case was regarded as one of mitral valve disease with secondary enlargement of the liver. On the first admission she remained till August 29th, and improved very much. A few days before leaving the note reads that "the ascites has disappeared, the heart's action is regular, the pulse 72, and of medium volume. The apex beat is in the sixth space in anterior axillary line ; there is a wide area of heaving pulse as high as the third rib. There is a systolic thrill at the apex, and a loud, musical, systolic murmur which is transmitted to the back, and the pulmonary second sound is intensely accentuated."

We had no other idea about the case than that it was one of mitral insufficiency, though the question came up on several occasions whether or not she had in addition adherent pericardium.

She was readmitted October 8th, 1891, with great shortness of breath and ascites. She was tapped, and nearly three litres again removed. She was very much cyanosed, particularly in the hands and feet. The cardiac physical signs were the same—a loud, rough, apex systolic murmur transmitted well to the spine. In diastole at the apex there was a soft rumble, but no definite murmur. There was a systolic murmur in the sternal region, hut no special difference could be determined between it and the murmur in the apex area. The urine always contained a small amount of albumen, and at times granular and hyaline casts. Very full notes were made of the case at intervals, particularly with reference to the condition of the heart. The apex beat seemed to have lowered, and could be felt in the seventh space, 7 c. m. outside the nipple.

Throughout the summer of 1892 she was tapped on several occasions, and the condition remained very much the same. There was no general anasarca, but much cyanosis of the hands and feet.

Before her second discharge on the 16th of June, 1892, it was noted that the first sound at the apex was sharp, followed by a loud, musical, systolic murmur, which was heard throughout the axilla and back, having at the scapula an intense blowing character. Passing upwards and inwards from the apex, the murmur lost its musical character. The second sound, which was heard feebly at the apex, was intensely accentuated in the third left interspace. The sounds in the aortic region were clear. For the first time, just before her discharge, on the fourth cartilage to the left of the sternum, a double murmur was heard, a soft diastolic, behind, as it were, the accentuated second sound. Passing down the left sternal border the murmur became lost.

After tapping the liver could now be felt very plainly. The border was about three fingers breadth above the navel.

She was readmitted on September 21st, 1892, and remained continuously in the hospital until her death, December 8th, 1894. During this entire period ascites was the marked and prominent feature. Prior to this admis-

sion she had been tapped only three or four times. To December 7th, the day before her death, she was tapped 121 times, and from three to five litres were removed on each occasion. We thought that in all probability there was adherent percardium as well as extreme mitral insufficiency. There was systolic retraction in the apex region, marked bulging of the praecordia, and the upper limit of pulmonary resonance seemed fixed.

During these last two years, the condition of the liver interested us very greatly. When the abdomen was empty the organ formed a visible and actively pulsating tumor midway between the navel and the costal border; and it is well figured in my lectures on the diagnosis of abdominal tumors.* It was smooth, descended with inspiration, and expanded visibly Its edge was rounded and the whole mass could be grasped in the hand, feeling like a large spleen. The edge passed beneath the right costal margin about the nipple line, and far over on the left costal margin the enlarged spleen could be felt. Grasped in the hand, the pulsation was expansile and forcible, a little later than the cardiac impulse.

Early after her admission on this occasion, there was felt for the first time also a distinct peritoneal friction rub just below the edge of the liver. The condition of the heart did not materially change, except that the area of dulness increased. The loud, intense, apex systolic murmur persisted, and was heard all over the right side of the chest. In the sixth space a little above the nipple, there was a rumbling, echoing sound occupying the entire diastole, and in a limited area this had almost the characters of a presystolic murmur. The first sound was always well heard. Along the left sternal margin the soft diastolic murmur already mentioned was well heard. It was not audible at the aortic cartilage, but in the third, fourth, and fifth interspaces on the left side. She never had general anasarca after her first admission.

There were two additional features of great interest in her case. It was noticed on her first admission that the cyanosis of the hands and feet was extreme. This persist-

*Appleton & Co., N. Y., 1894.

ed with but little change, no matter what her general condition might be, whether she was suffering with great dyspnoea or whether she was wheeling herself about the ward in a chair, the hands and feet were permanently cyanotic. She became very thin, but the extreme lividity without any œdema was a remarkable feature in her case.

Then, shortly after her last admission, it was noticed that subcutaneous fibroid nodules were developing, and a series of these appeared about the knuckles, the wrists, and the elbows.

As I have already mentioned, the primary lesion in this case was thought to be mitral sclerosis with moderate narrowing of the valve, and enormous secondary hypertrophy and dilatation of the right chambers. The evidence also pointed to adherent pericardium, and as the patient had evidently a shrunken, cake-like liver, with recurring ascites, and a well-marked peritoneal "reibe-gerüsch," and remembering my former case at the University Hospital, Philadelphia, I made a diagnosis of proliferative peritonitis with peri-hepatitis and peri-splenitis, secondary possibly to the adherent pericardium.

The child died on December 8th, 1894, the day after her 121st tapping; the respirations became very much embarrassed, the heart's action extremely rapid, and she sank and died in coma.

Autopsy by Dr. Flexner. Anatomical Diagnosis—*Chronic adhesive pericarditis—pericarditis affecting especially the right ventricle—chronic adhesions between pericardium, diaphragm, and lung—enormous hypertrophy and dilatation of heart, particularly of the chambers on the right side—hypertrophy of left ventricle—dilatation of cardiac orifices; normal valve segments—chronic proliferative peritonitis with peri-hepatitis and peri-splenitis—cirrhosis of the liver—chronic passive congestion of the spleen, intestines, stomach, and kidney—fibrous nodules about the elbows and hands.*

The body was much emaciated; the legs were a little œdematous; the veins were prominent, but the extreme lividity of the arms and legs had disappeared. The abdomen was distended and there was a prominence between the recti muscles. The superficial abdominal and thoracic

veins were prominent. There were subcutaneous fibroid nodules, ranging in size from a split pea to a bean, attached to the subcutaneous fascia.

There were about 2000 cc. of clear fluid in the peritoneum.

The omentum was rolled up, thickened, perforated in many places, adherent to the abdominal wall and to the transverse colon. The parietal peritoneum over its entire extent was opaque, in many places covered with nodular thickenings and threads of fibrous tissue. The mesentery was shrunken, and its serosa opaque and thickened. The lymph glands in general were not enlarged. The spleen was adherent to the diaphragm, capsule irregularly thickened, and its edges and posterior part was dense in consistence, and dark in color. It was moderately enlarged.

The liver was firmly bound by old adhesions to the diaphragm. It was much deformed; without clear separation between the right and left lobes, but the whole organ was enveloped in a thickened, pearly white membrane of from two to five mm. in thickness. The gastro-hepatic omentum was also thickened. From the hilus of the liver thickened bands of fibrous tissue passed with the portal vessels, and in some places the Glissonian sheath was greatly thickened. The liver tissue itself was greatly altered in appearance; the cut surface was dark, almost black, with here and there light areas apparently of fat tissue. The central veins of the lobules were dilated. The length of the liver was 15 c. m.; thickness 6 c. m.; width 10 c. m. The consistence was greatly increased. The hepatic veins were enormously enlarged, and even in the middle of the organ they easily admitted the little finger.

The kidneys presented a markedly cyanotic appearance; on section there was much congestion, the consistence was much increased, almost of stony hardness. The mucous membrane of the stomach and intestines was greatly congested. Otherwise it showed no special changes.

Thorax.—The heart occupied an enormous space in the front of the chest. The intercostal spaces were dissected out so as to get accurately the limits of the heart in situ. From the mid-sternal line the following were the measure-

ments: In the second interspace to the right, 6 c. m.; to the left, 8 c. m.; third interspace to the right, 8 c. m.; to the left, 11 c. m.; fourth interspace to the right, 11 c. m.; to the left 15 c. m., so that the total transverse measurement of the heart in the fourth interspace was 26 c. m. (10½ in.). In the sixth interspace the right border of the right auricle is 11 c. m. from the median line, and the apex was 14 c. m. (6 in.). The right auricle was enormously large, and (before removal of the heart) measured, in an oblique direction from the tip of the appendix to the orifice of the cava, just above the diaphragm, 14 c. m. (6 in.). The front of the heart was formed almost entirely by the right chambers. The pericardial sac was partly obliterated by old adhesions, which were situated particularly over the right ventricle, involving the left ventricle only a short distance beyond the septum. The greater part of the right auricle itself was free and the whole of the posterior surface of the heart. The adhesions were composed of strong fibrous bands. The right auricle was enormously distended and filled with partially decolorized clots. The walls seemed somewhat thickened and the endocardium was opaque. The orifice of the inferior cava was unusually large, measuring 4.5 c. m. in diameter; looking into the cava from the auricle one saw directly the large openings of greatly dilated hepatic veins, into which the index finger could be passed. The coronary sinus was also greatly dilated and the foramina Thebesii were unusually distinct. The right ventricle was much dilated and hypertrophied. The tricuspid orifice was large; admitted five fingers freely. The papillary muscles were thickened and flattened; the trabeculae likewise thickened and flattened. The segments of the tricuspid valve were a little opaque but not shrunken. The septum ventriculorum was closed. The thickness of the wall of right ventricle was 8 mm.; the length, 11 c. m. The pulmonary artery was large. The valve segments were normal and held water. The left ventricle was not nearly so large as the right; measured 8 c. m.; thickness of the muscular wall, 10 mm. The mitral segments were not shrunken, but were thicker throughout than normal. The mitral orifice admitted two

and a half fingers. At the point of insertion of the chordæ tendineæ of the mitral segments there were a few calcified points. The posterior papillary muscle and the trabeculae were flattened. The endocardium of the left auricle was opaque and thickened, but the cavity itself was not specially dilated. The aortic valves held water. The segments were not specially thickened, except the middle one, which was thickened, and this segment presented a small aneurismal dilatation as large as a split pea, which looks towards the artery. The aorta just above the valve was 6 c. m. in circumference; at the end of the arch, 3.5 c. m.; at the coeliac axis, 3 c. m.; just above the bifurcation, 2 c. m. The vessel was small and the walls thin.

On microscopical examination the liver showed enormous dilatation of the vessels. The tissue looked almost like an angioma. In other places the liver tissue was better preserved. The increase of connective tissue was not diffuse, but in circumscribed thick bundles. The muscular tissue at the right ventricle showed a moderate degree of fatty degeneration, which was much more marked than on the left side.

Remarks.—There are many points of great interest in connection with this case, but I only can refer here to the recurring ascites with proliferative peritonitis. The case is almost the exact counterpart of the one under my care in Philadelphia.

Chronic proliferative peritonitis is met with chiefly in adults under conditions similar to those which produce cirrhosis of the liver. It has been in my experience a rare disease in childhood; and in the adult the symptoms are in reality those of atrophic cirrhosis of the liver, and the diagnosis is very rarely made before death.

Rosenbach is the only author I can find who suggests the possible connection between adherent pericardium and a chronic peritonitis; and he thinks that the chronic proliferative process extends along the veins, through the diaphragm, and involves the peritoneum. It is not unlikely that in the case here reported this sequence may have occurred. Some of the cases of indurative mediastino-peri-

carditis present a very similar clinical picture (see Harris, *Medical Chronicle*, 1895).

Other points of great interest in the cases were: The enormous hypertrophy and dilatation of the heart with only partial pericardial adhesions; the clinical picture of mitral valve disease, which most of these cases of adherent pericardium present so soon as the cardiac dilatation becomes excessive; the diastolic murmur along the left sternal margin which was probably associated with insufficiency of the valves of the pulmonary artery—Graham Steell's murmur of increased pulmonary tension; the subcutaneous fibroid nodules in a child who had never had acute arthritis and who had no mitral valve disease; and lastly the remarkable tumor formed by the pulsating liver.

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